

Old
Series,
Vol. LII

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. XLIV

SCIENCE LIBRARY

The Auk

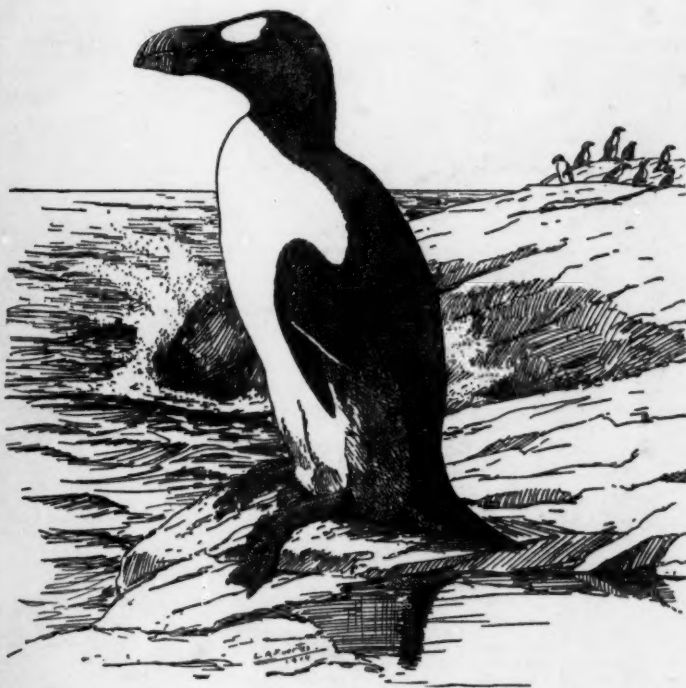
JUL 19 1927

A Quarterly Journal of Ornithology

Vol. XLIV

JULY, 1927

No. 3



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

CONTENTS.

THE HUMMINGBIRDS OF CALIFORNIA. By Robert S. Woods. (Plates XV-XVII)	297
THE RUFFED GROUSE IN WINTER. By R. A. Johnson. (Plates XVIII-XIX)	319
THE DESIGNATION OF BIRDS' RANGES. By Joseph Grinnell	322
TUBINARES OFF THE NORTHWEST COAST. By John Treadwell Nichols	326
THE FEEDING RANGE OF CERTAIN BIRDS. By Wilbur K. Butts	329
NOTES ON THE BIRDS OF SOUTHEASTERN ALASKA (concluded). By Alfred M. Bailey	351
PHOTOGRAPHING WAYNE'S CLAPPER RAIL. By Donald John Nicholson. (Plates XX-XXI)	368
NOTES ON FLORIDA BIRDS. By Arthur Cleveland Bent and Manton Copeland	371
PTILOSIOS OF THE HOUSE WREN. By Rudyerd Boulton	387
GENERAL NOTES. —Horned Grebe in Breeding Plumage in North Carolina, 415; Masked Duck (<i>Nomonyx dominicus</i>) in Texas, 415; Snake-bird in South Carolina, 415; Farallon Cormorant Killed by Unusual Accident, 416; The Glossy Ibis in Delaware, 416; Glossy Ibis in Delaware, 417; Glossy Ibis at Wilmington, Delaware, 417; Glossy Ibises Reported Breeding in Louisiana, 418; Black-crowned Night Herons in winter on Nantucket, 418; Late Nesting of the Bob-white, 418; Nesting of the Western Mourning Dove, 418; Western Mourning Dove (<i>Zenaidura macroura marginella</i>) in Arkansas, 419; Turkey Vulture in Connecticut, 419; The Duck Hawk in Guiana, 419; A Hawk Flight, 429; Egg of the Sun Parrot, 420; The Virginia Night Hawk in the Bahamas, 421; Nesting of Chuck-wills-widow, in Kansas, 421; The Rediscovery of <i>Myiarchus sciateri</i> Lawr., 422; The Snow Bunting (<i>Plectrophenax n. nivalis</i> , in Georgia, 423; Breeding Range of Macgillivray's Seaside Sparrow (?), 423; <i>Streptoprocne semicollaris</i> (DeSaussure) in Chihuahua, 424; Prothonotary Warbler Breeding in Chatham Co., Georgia, 425; The Yellow Warbler (<i>Dendroica aestiva aestiva</i>) in Dutch Guiana, 425; Connecticut Warbler at Atlanta, Ga., in Spring, 426; Chickadee and Polyphemus Cocoon, 426; Hudsonian Chickadee in Michigan and Wisconsin, 427; Rare Birds in North Carolina, 427; Supplementary Records for Upper South Carolina, 428; Effect of an Early Spring on the Resident Breeding Birds of Athens, Clark Co., Georgia, 430; Notes from the Chicago Area, 431; Three Records for Colorado, 432; Denver Birds, 432; An Avian Parasite, 433.	
RECENT LITERATURE. —Mathews's 'The Birds of Australia,' 435; Hellmayr's Catalogue of the Tyrannidae, 442; Bent's 'Life Histories of North American Marsh Birds,' 443; Hoffman's 'Birds of the Pacific States,' 444; Grinnell and Wythe on Bird Life of the San Francisco Bay Region, 445; Mailliard on the Birds of Modoc Co., California, 446; Bailey's 'Biological Survey of North Dakota,' 447; Bannerman on the Birds of Tunisia, 447; Reiser on Birds' Eggs from China and Tibet, 448; Recent Papers by Delacour, 449; Bulletin of the International Committee for Bird Protection, 449; F. Stresemann on <i>Collocalia brevirostris</i> , 449; Preble on the Woodcock, 450; Miller on Structural Variation in Scoters, 450; Recent Papers by Dwight and Griscom, 450; Lewis on the Production of Elder Down, 451; Chapman on <i>Saltator aurantirostris</i> , 452; Griscom on Birds of Yucatan, 452; Friedmann on Testicular Asymmetry in Birds, 453; Balsac's Ornithology of Central Sahara and Southern Algeria, 454; Richmond's List of Generic Names of Birds, 454; Williamson's 'The Old Stag,' 455; Scoville's 'Runaway Days,' 455; Dinesen on Birds of Northern Iceland, 455; Barbour and Peters on Two More New Birds from Cuba, 456; Peters on the Golden Warblers, 456; Recent Papers by Lonnberg, 456; Burleigh on Birds of the Georgia College Campus, 457; McAtee's Propagation of Game Birds, 457; Economic Ornithology in Recent Entomological Publications, 458; The Ornithological Journals, 459; Ornithological Articles in Other Journals, 468.	
CORRESPONDENCE. —Kennard on Snow Geese, 471; Snowy Owl Report, 472.	
NOTES AND NEWS. —Obituary—Allan Octavian Hume, 473; Loveridge Collection, 474; Baird Ornithological Club, 474; New England Sportsmen's Show, 474; Rainey Wild Life Sanctuary, 475; Savannah Bird Refuge, 476; Bald Eagle Protection, 476; Roosevelt Memorial, 476; Birds of Ceylon, 477; Protection of Yellowlegs, 477; Heath Hen Situation, 477; Personal Notes, 478.	

97

19

22

26

29

51

58

71

57

5;

7;

16;

17;

18;

19;

20;

21;

22;

23;

24;

25;

26;

27;

28;

29;

30;

31;

32;

33;

34;

35;

36;

37;

38;

39;

40;

41;

42;

43;

44;

45;

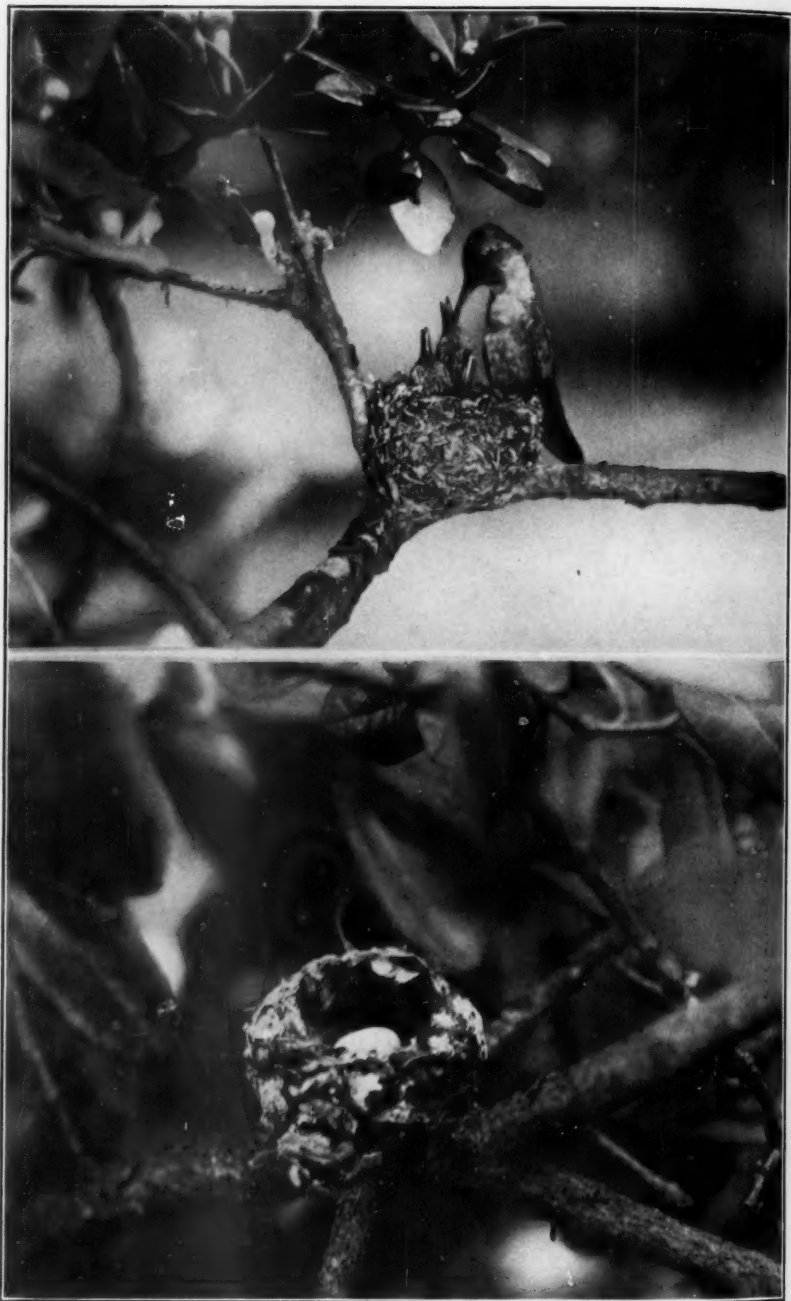
46;

47;

48;

49;

50;



1. FEMALE COSTA'S HUMMINGBIRD FEEDING YOUNG.
2. NEST OF COSTA'S HUMMINGBIRD—BITS OF PAPER USED FOR ORNAMENT.
NEST, ATTACHED TO UPRIGHT STUB BY COBWEBS.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XLIV.

JULY, 1927.

No. 3.

THE HUMMINGBIRDS OF CALIFORNIA.

COMMENTS ON THEIR HABITS AND CHARACTERISTICS.

BY ROBERT S. WOODS

(*Plates XV-XVII*)

ALTHOUGH the Hummingbirds comprise one of the largest families of American Birds, including some five hundred species, but nineteen have been found within the United States, and of these only one occurs east of Texas and the Rocky Mountains. Of the nineteen, two species, both of which were taken in California, are thought to have been mere adventitious hybrids, while nine others are restricted to within about 100 miles of the Mexican border in Arizona, New Mexico and Texas, several of these latter being represented only by casual visitants or stragglers from their true homes farther to the south. Of the remaining eight which may be considered more definitely a part of our fauna, six species are of common occurrence over large portions of California, while a seventh has also been found within the borders of the State.

Before proceeding to the more specific discussion of the California Hummingbirds, it is interesting to note that although green is the prevailing color on the throats or other luminous parts of the plumage of the Mexican, Central American and West Indian species, occurring oftener than all other colors combined, this color is not found on the throat of any of the eight Hummingbirds whose range lies largely within the United States. In four of these the gorget is red, in two it is reddish purple or rose pink and in the remaining two, violet. In only five or six others of the 140

species (exclusive of subspecies) listed by Mr. Ridgway in 'Birds of North and Middle America' does the red color appear, and in none of the 30 species living in or near the Panama Canal Zone. The impression is thus gained that northern latitudes must in some way be conducive to the development of red areas in the plumage of the Trochilidae, and this impression is strengthened when we consider that the Rufous and the Ruby-throated Hummingbirds, which reach the highest latitudes in summer, and likewise Anna's and Allen's Hummingbirds, which winter farthest north, all have red gorgets, while the Rufous Hummingbird, the hardiest pioneer of all, is unique in the reddish color of its back as well. Despite the predominance of yellow flowers, pure yellow is entirely lacking in the plumage of North American Hummingbirds.

However scanty in numbers as compared to the multitude of species inhabiting such countries as Ecuador, Colombia or even Costa Rica, with respect to brilliancy of coloring the California Hummingbirds need not suffer by comparison with the tropical species, many of which are of plain and somber garb. Mr. Ridgway declares that "of all the gorgeted Hummingbirds by far the finest are the two species of the genus *Calypte* which inhabit parts of Mexico and California and the single one found in Cuba," and quotes Mr. Gould to the effect that the Rufous, Costa's and Anna's Hummingbirds "are unequaled for the rich metallic brilliancy of certain parts of their plumage, by any other members of the family." (Report of National Museum, 1890, pp. 301 and 336.)

Omitting from consideration the very rare Flores's and Violet-throated Hummingbirds, thought to have been hybrids of *Selasphorus* and *Archilochus*, respectively, with *Calypte anna*, the manner of occurrence of the various species within the State of California may be briefly indicated as follows:

***Archilochus alexandri*.** BLACK-CHINNED HUMMINGBIRD.—Summer visitant to southern California and northward on both sides of the Sierra Nevada. Absent from the northern coast region and the Santa Barbara Islands.

***Calypte costae*.** COSTA'S HUMMINGBIRD.—Summer visitant to the mesas and deserts of southern California, ranging as far northward as Santa Barbara and Inyo Counties.

***Calypte anna*.** ANNA'S HUMMINGBIRD.—Resident, mainly west of the high mountains, northward through the San Francisco Bay region and the Sacramento Valley.

***Selasphorus rufus*.** RUFOUS HUMMINGBIRD.—Spring migrant through the valleys and foothills of the Pacific slope; late summer and fall migrant, principally along the mountain ranges.

***Selasphorus alleni*.** ALLEN'S HUMMINGBIRD.—Spring and summer visitant to the humid coast belt, as far south, locally, as Santa Barbara and Ventura Counties. Resident on the Santa Barbara Islands. Migrant through the southern end of the State.

***Selasphorus platycercus*.** BROAD-TAILED HUMMINGBIRD.—Summer visitant to the higher mountain ranges of eastern Inyo and Mono Counties.

***Stellula calliope*.** CALLIOPE HUMMINGBIRD.—Summer visitant to the Sierra Nevada and the higher mountains of southern California. Spring migrant along their bases.

OBSERVATIONS IN THE SAN GABRIEL VALLEY.

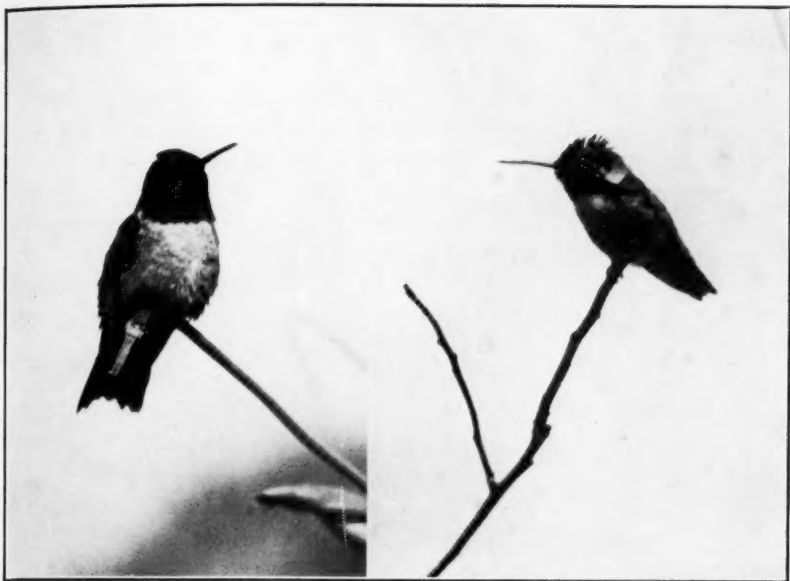
A dozen years' experience in raising oranges and other subtropical fruit at Azusa, California, not far from the mouth of the San Gabriel Canyon, in Los Angeles County, have given the writer an opportunity to become more or less familiar with six of the Californian species of Hummingbirds, which gather in considerable numbers in and about the orange groves during the blooming season, which usually coincides with the spring migration of most of these species. I have seen all six here within less than 30 days, and at times in the month of April all but Allen's Hummingbird appeared to be present together.

Allen's Hummingbird is not very common in this locality, but occasionally, from the last of January until the vernal equinox, a metallic screeching sound draws one's attention to a male of this species as it tarries briefly among the flowers. The Rufous Hummingbird is the next of the migrants to appear, usually arriving early in March and leaving late in April. During part of this time it is the commonest species. My earliest record for the Rufous is February 17 (1926) and the latest for the spring migration May 1 (1924). The adult male is only an occasional visitant on the southward migration in late summer, though the females, or more probably immature birds of both sexes, are seen more frequently. Costa's Hummingbird is irregular in its arrival, but may be looked for at any time after the middle of March (the

earliest was noted on March 16, 1923), and stays until June or the first of July, being the only species which I have found nesting about the grove. The Black-chinned Hummingbird is a very transient visitant in the month of April, but returns after the breeding season, sometimes as early as the last of June, and is likely to remain in the Valley for a month or more after the Costa's have departed. The Calliope Hummingbird makes only a short stay, being present in small numbers, if at all, for a week or two in April. Anna's Hummingbird is apt to be seen at any season, except possibly in midsummer, but never in abundance.

The spring migrants, and likewise Costa's Hummingbird when it first arrives, are almost constantly in a state of activity, so that it is often difficult to obtain more than a fleeting glimpse of them as they chase one another about. At these times there appears to be a great preponderance of males, which is partly accounted for, no doubt, by the quieter and more retiring habits of the females. Anna's Hummingbird, being a resident, does not seem to share to any great extent in the feverish activities of the migrants, but for the most part sits aloof upon a dead twig at the top of some bush, and as the season advances the male Costa's also follows that example. Hummingbirds feel the heat, and on hot days they are likely to abandon their exposed perches and seek a shady spot. A high wind also will cause them to remain in a sheltered place, but on a cloudy, misty day they are apt to be much in evidence.

A Hummingbird darting about at top speed is not a convenient subject for identification by the use of the usual keys; hence, a more intimate knowledge of certain habits and characteristics is often of assistance. The gradations in size are not distinct enough to be of great service as a means of recognition, though when the Anna's and Calliope Hummingbirds are seen together the contrast is rather striking. In the Black-chinned Hummingbird it is particularly hard to make out the color of the throat, because of the comparative dullness as well as the restricted area of the metallic coloring. The male of this species may always be known, however, by the square-cut gorget and the general blackish color of the sides of the head, in sharp contrast to the white of the neck and the conspicuous postocular spot.



1. BLACK-CHINNED HUMMINGBIRD.

2. COSTA'S HUMMINGBIRD.

3. NEST OF COSTA'S HUMMINGBIRD PARTLY SUPPORTED BY LEAF WHICH BECAME DETACHED LEAVING IT HANGING BY ONE EDGE.



A pronounced metallic screeching or rattling sound accompanies the flight of the male Rufous and Allen's Humming birds and in a slightly lesser degree that of the male Black-chinned Hummingbird. The flight of the Calliope Hummingbird is not definitely metallic, but sometimes is characterized by a shrill, strident quality not exhibited by any of the other kinds. The male of this species is able to produce at will a loud buzzing like that made by a large fly entangled in a spider's web. I have seen one leave his perch repeatedly and hover near by to buzz in this way, apparently for his own entertainment. The only sound ordinarily heard in connection with the flight of the male Anna's and Costa's Hummingbirds, as with that of the females of all species, is a soft, deep hum which increases in volume and pitch when the bird accelerates its speed, and has at times a certain silken rustling quality.

If the male Anna's and Costa's Hummingbirds lack distinguishing peculiarities of flight, they are the most easily recognized through their vocal utterances. The squeaky, metallic song of the Anna's Hummingbird, in which it indulges quite persistently with little regard for season, is a sure indication of the species, while the presence of a Costa's Hummingbird is frequently announced by the two-or-three-syllabled whistling call with which he greets passing members of the tribe from his perch or salutes his mate as he hovers before her. The young males begin practicing on these whistling notes, which are doubtless among the highest-pitched sounds audible to the human ear, before they have yet attained their brilliant gorgets, with results that sometimes rather resemble the song of the Anna's Hummingbird, though much fainter and less sustained. The other species seem less given to vocalization, aside from the feeding note and the excited twittering accompanying the chase, which are common to all species and both sexes alike.

A male Hummingbird, when too far away to be distinctly seen, can often be identified by the manner of its "nuptial flight," so called; or even when not visible, by the utterance accompanying such flight. It may be questioned whether the term "nuptial flight" is correctly used in this connection, as the Hummingbird frequently directs his attention on these occasions toward one of a different species or, as often as not, toward a bird of another

sort entirely. The fact that this maneuver is practiced only by the adult males, however, would imply some sexual significance, so for lack of a more accurately descriptive name the present one may well be retained. Perversely enough, the females, which are often so difficult to identify by their appearance, have no such distinguishing characteristics of voice or flight.

The most elaborate nuptial flight is that of the Anna's Hummingbird. When carried out in its complete form the bird mounts almost vertically to a lofty height, then suddenly descends with terrific speed; when within a short distance of the object of its attention it turns rather sharply upward again, at the same time giving utterance to a loud, explosive chirp resembling the bark of a ground squirrel, and returns to a point directly overhead, where it pauses for a few seconds to render its song, after which it again ascends more slowly and repeats the process until it tires or the other bird departs, with the Hummingbird in hot pursuit. The Costa's Hummingbird, instead of making a more or less abrupt turn, sweeps through a great arc to describe an immense letter U, then passes overhead to shoot downward again, either from the same direction or at a new angle. A continuous shrill whistle or miniature shriek accompanies most of the downward course and part of the upward—in other words, that part of the circuit in which the velocity is highest. This Hummingbird often ends his series of loops by darting away at high speed in an erratic, zigzagging flight. The Calliope Hummingbird also performs a nuptial flight of rather similar character, but in form tending toward the hyperbolic and marked at the lowest point by a curiously muffled yet explosive squeak, quite characteristic of the species.

In addition to this lofty type of nuptial flight, which seems to be shared to some extent by all the species, other forms are used by certain of them. Allen's Hummingbird flies rather slowly back and forth along a path such as would be described by a giant pendulum, with a sort of lateral writhing movement of the body and extended tail and a vibratory metallic noise, but without vocal sound. Again it will poise itself close in front of another bird and rapidly shuttle to and fro sidewise through a space of perhaps a foot or two. My observation of the Allen's and Rufous Hummingbirds has not been extensive enough to determine whether

their practices in this respect are identical, but a close similarity would be expected from the nearness of their relationship. During its stay in southern California, however, the type of nuptial flight favored by the Rufous Hummingbird is a swooping dive like that of the Calliope Hummingbird, punctuated at the bottom of its course by what might be described as a tremulant squeak or a rapid succession of about four thin, vibrant notes. This sound, like that of the Calliope Hummingbird, is of so peculiar a nature and so different in quality from the normal voice of the bird that the only reason for assuming that it is produced by the throat rather than the wings is the unmistakably vocal origin of the sound in the case of some of the other species.

The shuttling of the Black-chinned Hummingbird, which follows a path like a narrow figure 8 lying on one side, has often been mentioned in accounts of the species. Its other form of nuptial flight most closely resembles that of the Rufous Hummingbird, just described, but the vocalization is more prolonged and of rather different character—a long-drawn, pulsating, plaintive, liquid note, probably the most pleasing utterance of any of our Hummingbirds. The heavy droning sound of its flight, so noticeable in the shuttling movement, is heard in this case only while momentum is first being gained on the downward swing. The shuttling flight, it may be noted, is practiced almost solely by those species in which the wings of the male are specially modified for noise-making purposes.

To see an Anna's Hummingbird, hovering motionless in the air with body nearly horizontal, suddenly begin to rise rapidly and vertically, as if by a reversal of the force of gravity, is to obtain some idea of the bird's remarkable mastery of the air. Despite the Duke of Argyle's postulate that "no bird can ever fly backwards," the ability of the Hummingbird to fly backwards or in any other direction it wishes can hardly be questioned by one who has watched an aerial tilt between two of these birds, during which they advance and retreat at every angle, performing all manner of evolutions with the appearance of utmost ease. In the matter of flight, the difference between work and play seems to be well recognized by the Hummingbirds. Considering the great amount of unnecessary flying which they do, it is amusing to see one hang

almost upside down rather than use its wings while probing a flower.

No one who possesses an appreciation for color can tire of studying the changing hues of a Hummingbird's throat. The statement has been made by an eminent naturalist that the luminous reflection appears only as a single spot ever varying in position with the movements of the bird. But if an Anna's Hummingbird, for example, is viewed directly from the front, with the light at the observer's back, the whole head and gorget glow in their full resplendence. Sometimes when it approaches and hovers in front of one, as it is apt to do, the effect is as if a coal of fire was suspended in mid-air.

The color of the head and throat of Anna's Hummingbird is less changeable than are the colors of some species, but in certain aspects the beauty of the brilliant rose-pink gorget is enhanced by a border of richest gold. Costa's Hummingbird, on the other hand, shows a wide variation in its coloring according to the conditions of the light. The head and gorget of a single individual will sometimes appear violet-blue and at other times magenta, approaching the color of Anna's Hummingbird.

Unlike the latter species, the coloring of Costa's Hummingbird is not exhibited to the best advantage when directly reflecting the brightest rays of the sun, as the intense brilliancy causes a paling of the delicate violet tints. In a more diffused light rich blue and red high tints may often be observed on different parts of the head at the same time. The gorgets of the Rufous and Allen's Hummingbirds are normally of an intense scarlet, but at some angles appear as if pure burnished gold. The reddish-purple throat of the Calliope Hummingbird varies little in shade, but the odd color pattern and serrated edges of its gorget, together with the interest that attaches to it from its position as the smallest of our birds, make it by no means the least attractive of the Hummingbirds.

Numerous statements, some of them directly contradictory, have been made regarding the disposition and comparative aggressiveness of the several species. From my own observation I have been unable to detect any constant differences in this respect, and believe that those noted by others may perhaps be attributed



1. ANNA'S HUMMINGBIRD FEEDING AT THE WILD FUCHSIA OR HUMMINGBIRD FLOWER (*ZAUSCHNERIA CALIFORNICA*) TAKEN IN OCTOBER.
2. ALLEN'S HUMMINGBIRD AND TREE TOBACCO. THE LUSTER OF THE METALLIC GREEN BACK IS CLEARLY DISCERNIBLE. TAKEN IN FEBRUARY.



to season or circumstances. The Calliope Hummingbird, for example, which has been described as retiring and peace-loving, taking no part in the contests of the larger species, does not, in fact, hesitate to attack Anna's Hummingbird and when chased away immediately returns to renew the challenge. On the other hand, I have seen Allen's Hummingbird, to which Mr. Allen ascribed unusual aggressiveness, meekly turn tail when an Anna's or a Rufous Hummingbird resented an infringement of its territory. (Report of National Museum, 1890, pp. 349 and 357.)

In the same connection Mr. Allen referred to the great activity of Allen's Hummingbird, as contrasted with the Rufous. While passing through the San Gabriel Valley Allen's Hummingbird is indeed very active, though hardly more so than the other spring migrants; but on Santa Catalina Island during the nesting season the same restful disposition is apparent that is shown by other species under similar conditions. There the males remain perched on wires or exposed twigs for quite long periods and appear to confine themselves largely to certain restricted areas when not feeding. Towards evening, like other species, they make short sallies in Flycatcher fashion after passing insects too minute to be discerned by the human eye.

As to the motive for the frequent contests and pursuits, it is of course impossible to speak with certainty, though there is no doubt that a Hummingbird, having laid claim to a particular feeding ground, resents any competition within its limits. These vested rights seem to be recognized by the intruders, who seldom tarry to dispute possession. In general, however, and especially during migrations and among the young birds in midsummer, when such activities are most pronounced, they impress one as being mainly the result of exuberance of spirits and a sportive disposition. This is borne out by the lack of injury and, usually, of any contact between the contestants; also by the fact that the diversion seems to be equally enjoyed by pursuer and pursued, as the latter will often return and hover in front of the former as an invitation to another race. Sometimes a sound is heard as of the clash of wings, but by close attention it will be seen that this noise is often produced when the birds are entirely separated and occasionally by a solitary individual, probably by striking the wings together over the back.

A sick Hummingbird, however, seems to receive little sympathy from its fellows. I had wondered what would be the result if a Hummingbird quietly refused to take part in these skirmishes, and on a certain occasion when one of the three or four which were frequenting the garden seemed to be sick or injured and hence averse to unnecessary activity, I was able to note the outcome. Another, apparently a young male Black-chinned Hummingbird, with a single dark spot on the throat, would shuttle back and forth in front of it as it sat on some twig, darting at it at the end of every few oscillations, sometimes striking it with its bill, until the unfortunate bird would be compelled to take flight.

I am convinced that the Hummingbird's actions towards other birds are usually free from hostile intent, even when near its nest. As an indication of this, I have known a Dove to make its nest in the same tree and within a few feet from where a Hummingbird was rearing her young, which would hardly have been likely had the Hummingbird maintained an unfriendly attitude. The Hummingbird's pursuit of other birds seems to be due to its love of the chase and depends upon its mood, as it often ignores their near approach and even allows itself to be bullied by them without showing resentment. Similar deductions may be drawn from the lack of fear evidenced by birds as small as the Goldfinches, though the Hummingbird could undoubtedly make itself disagreeably felt if it were so inclined.

Some of our Hummingbirds seem to be in a measure, at least, independent of the presence of flowers, since Anna's Hummingbird manages to subsist at times when, on account of severe frosts, flowers are extremely scarce. During the nesting season it has seemed to me that the female Costa's Hummingbird visits the flowers much less than does the male. At such times the female may often be seen buzzing about inside non-flowering trees and shrubs. While the search may be primarily for cobwebs or other nesting material, numerous minute insects and spiders might incidentally be obtained.

Hummingbirds are attracted to flowers initially by their coloring. A bunch of carrots will sometimes arouse the interest of a Hummingbird, and I have seen one probing clusters of bright orange *Crataegus* berries. But when once established in a locality they

will habitually pass over some of the showiest flowers as unsuited to their uses, seeking out others, perhaps much less conspicuous, which minister to their needs. An important addition, from the Hummingbird's standpoint, to native and cultivated flowering plants is the Tree Tobacco (*Nicotiana glauca*) (Pl. XVII). This rank-growing, drought-resistant South American shrub, now naturalized and widely distributed in southern California, bears a profusion of tubular flowers throughout the entire year. In connection with this plant may be seen an instance of the discrimination exercised by Hummingbirds when food is plentiful, in that they ignore the yellow mature flowers, probing instead the greenish newly opened blossoms. Costa's Hummingbird, for some reason, seems less partial to the Tree Tobacco than do the larger species.

Running water draws the attention of Hummingbirds, but they fear to enter it if it is of any appreciable depth, though they will sometimes drink while hovering over it. Most of their bathing is done in the dew collected on the foliage of plants. They will occasionally hover in a fine spray when available, and in winter I have seen Anna's Hummingbird alight on the lawn under the spray and indulge in a very thorough bath. As with other birds, early morning and cool weather are the favored times for bathing.

Owing to their close relationship in structure and habits, the nidification of all of the above mentioned species is very similar, and the variations due to individuality or adaptation to external conditions are often greater than the constant specific differences. The following account of the nesting of Costa's Hummingbird will therefore apply in many respects to the other kinds as well.

FAMILY LIFE OF COSTA'S HUMMINGBIRD

The family life of the male Costa's Hummingbird may be easily disposed of with the simple statement that he has none. No male Costa's has ever in my experience shown enough interest in family affairs to indicate his relationship with any particular brood. His mate, however, amply makes up for his deficiencies and finds no difficulty in managing the household without his aid.

The admirably delicate architecture of this Hummingbird's nest is well known and need not be enlarged upon here. Those which I have examined were about one and one-half inches in

outside diameter and were constructed with a framework of fibers, small flexible stems and pieces of string affixed to the supporting branch by means of cobwebs, and with a thick, soft lining of plant down and small feathers, the exterior being ornamented with numerous bits of bark, paper or miscellaneous dry vegetable matter securely bound thereon with cobwebs. Much of the soft material, as well as the ornamentation of the exterior, is added after the eggs are laid, so that the latter may be almost hidden for a time. This material is compacted by treading and turning about in the nest, the bill often being thrust beneath to rearrange some part of it. The quality of the construction varies considerably. Some of the nests are so flimsy that after the young are partly grown the nest becomes flattened out or broken down at the sides. Others are so solidly and compactly built that they retain their shape with no appreciable change as long as they are in use and for many months afterward. The first stage of the construction requires but two or three days, after which, however, an equal period of inactivity is likely to ensue before the first egg is laid.

At Azusa, California, the nests have been found at heights ranging from two to nine feet, but most commonly in the neighborhood of four feet. When a bush or small tree is selected, as is frequently the case, the nest is almost invariably located at a height of approximately one-half of the total height of the tree, but near the outside rather than the center, and in a position from which a reasonably clear outlook may be obtained. On this account trees of dense, leafy growth, such as an orange tree in thrifty condition, are not favored. The great majority of the nests discovered in this particular grove were placed in avocado trees or in bushes of the *Feijoa sellowiana* or Paraguay Guava, which together made up a corner of the orchard. If in a large tree, the nest is usually on a small twig near the end of a projecting lower limb. In an orchard under cultivation the latter location is a very hazardous one, since the nest is apt to be wrecked by the passage of team or implements, and furthermore is subject to destruction by strong winds or by the drooping of the slender twig under the increasing weight of the young.

It may be assumed that the scant height at which this species prefers to nest is the result of an inherited habit due to the fact

that large trees were originally absent from much of its range. The danger of injury through the tilling of the soil is, of course, something that the bird's instinct could not be expected to provide against, and the failure to recognize the possibility of disaster from wind or the sagging of the supporting twig might be accounted for by the fact that the natural vegetation of the arid regions is inclined to be more or less rigid, but poor judgment is sometimes shown too in building upon an inadequate or unstable base, which may in time result in the tilting or entire loosening of the nest. (Pl. XVI) The nest is frequently, and wisely, placed on a fair-sized horizontal branch, at the base of a twig or spur, to which it is securely anchored. Occasionally a limb an inch or more in diameter is chosen, which adds to the stability of the nest, but would render it more accessible to climbing predatory animals.

The eggs, as with all Hummingbirds, are two in number, white, tinged with pink when freshly laid, and oblong in form. An interval of about two days separates the laying of the eggs. Incubation, in every case that I have observed, has begun with the laying of the first egg, and the young are usually hatched out a day or more apart. If we are to accept the widely differing periods reported—from nine to eighteen days—the time of incubation must be regarded as extremely variable. On account of absences I have not succeeded in collecting as full information on this subject as could be desired, but data of varying accuracy obtained during five successive years indicate that the normal incubation period for Costa's Humming bird in the San Gabriel Valley is about sixteen days, lengthening in certain instances to as much as eighteen days, but never falling below fifteen days. These figures do not differ materially from the time of seventeen days given by Mr. Dawson for Anna's Hummingbird, whose incubation he regarded as lasting "a good deal longer than is customary with our other Hummers." (*Birds of California*, p. 942.) This is a longer time than is required by the eggs of the commoner passerine birds, notwithstanding the larger size of the latter.

There is a remarkable difference in the shyness of the various individuals when on the nest. Some will leave as soon as a person comes into sight, perhaps forty feet away; others will permit one

to reach within a few inches, or possibly, with care, even to touch them, without leaving the nest. The shyer ones, however, are inclined to hold to the nest more closely as the incubation advances, and especially around the time of hatching. Most of them, though easily frightened from the nest, will soon return if one stands quietly a few feet away, a decided reversal of the tendencies of the majority of nesting birds. Apparently the Hummingbird requires but little time for the procuring of food, since the eggs are seldom found uncovered.

The growing period of the young is even more markedly prolonged than is the incubation. Some eight broods for which the time was determined with fair accuracy remained in the nest from twenty to twenty-three days after hatching, with all but two approximating the higher figure. A similar period was sufficient for a pair of Western Chipping Sparrows not only to rear their young but to incubate their eggs as well. At the same locality the young of such birds as the House Finch, Green-backed Goldfinch, Western Lark Sparrow, Anthony's Towhee and Western Mockingbird were found to leave the nest in from ten to sixteen days, according to individual variations. The *Phainopepla* more closely approached the Hummingbird's time with nineteen days, the incubation period being sixteen days. Taking a species more nearly comparable in size to the Hummingbird, two broods of Black-tailed Gnatcatchers occupied their nests nine and ten days. Whether two or only one young Hummingbird was being reared made no difference in the rate of growth. It is possible that they develop more rapidly in other districts, since Mr. Dawson, who has observed this species near Santa Barbara, states that "under favorable circumstances the young birds fly in from ten to fourteen days" (*Birds of California*, p. 953); but in view of the notable uniformity of the Azusa records this variance would seem quite remarkable.

Even more pronounced than in most other altricial birds is the contrast between the newly hatched Hummingbird and its parents. The minute grub-like creature is black above and brownish below, with the body entirely bare except for a row of yellowish filaments along each side of the median line of the back. The bill is yellow and triangular, its length being but slightly greater than its width

at the base. The eye-sockets project beyond the base of the bill. Until about the sixth day, when the pin-feathers begin to appear, the most noticeable change, aside from the increase in size, is the gradual lengthening and darkening of the bill. The first part of the young Hummingbirds' lives is spent stretched out on the bottom of the nest, but after a time they become longer than the interior of the nest, so that they are gradually forced to raise their heads against its sides until at one stage of their growth their bills are pointing directly upward. After this their development is more rapid, and when they begin habitually to hold up their heads and assume an alert appearance, they are nearly ready to fly. The last few days before leaving the nest, the young birds frequently exercise their wings, sometimes perching on the edge of the nest for freer action. Finally a time is reached when, contrary to their former indifference, they are likely to leave on very slight provocation. A person may be quietly standing and watching them when as with one impulse both spring from the nest and fly in different directions. It sometimes so happens that the younger of the two is thus induced to venture forth before its wings are capable of sustained flight or of enabling it to obtain a foothold in a tree. On two such occasions I found that the bird might readily be picked up and when restored to its nest gladly settled itself to await more adequate strength.

The young Hummingbirds are fed by regurgitation, of necessity, at intervals of about half an hour. The feeding requires perhaps half a minute in all and is accomplished by a violent pumping process, with the bill thrust deep into the open mouth of the young bird. One would not judge that the slow growth of the Hummingbird was due to inability to supply sufficient food, since the mother, though bearing the entire care of her offspring, does not seem overworked, but has plenty of time to rest, preen her plumage and engage in skirmishes with other Hummers. Her care of the young continues for some time after they have left the nest. Then their call for food may be heard at intervals, a shrill cheep resembling the cries of other young birds rather than the voice of the adult Hummingbird. After the young have attained their full growth in other respects, they may still be recognized by the comparative shortness and straight, subulate form of the bill.

In no case within my knowledge has a second brood been successfully raised, and only twice have eggs been found late enough in the season to have represented a possible attempt to do so. In 1922 a set of eggs was laid about June 6, but was abandoned before hatching. In 1923 the season was unusually early; the first male Costa's Hummingbird was noted on March 16, and fledged young were seen by May 7. Later a set of eggs was discovered which hatched about June 2, but one of the nestlings fell to the ground, while the other failed to develop properly and was unable to fly even after thirty days in the nest. The following year a brood was still in the nest as late as July 4, but the nesting had begun much later than the previous year and this was doubtless the second attempt of a parent who had lost her first set of eggs. The males do not feel it necessary to await the outcome of their mates' labors; in 1924, following a very dry winter, the Costa's Hummingbirds nested in quite large numbers, but very few males were to be seen after the early part of the season.

For the purpose of affording an idea of the percentage of success and the causes of failure, a table is appended summarizing the results of several years' observations of the nesting of the Costa's Hummingbird. In order that the proportions may be more truly representative, only those nests have been included which were discovered before the eggs were hatched. The figures in each case indicate the number of nests, without reference to the number of eggs or young contained.

	1922	'23	'24	'25	'26	Total
Number of nests containing eggs	2	6	9	9	3	29
Destroyed in cultivation or by wind			3	2		5
Both eggs disappeared				1		1
Abandoned before hatching	1	1		2		4
One egg only hatched		1	1	2		4
Both eggs hatched	1	4	5	2	3	15
Died or abandoned after hatching			1	1	1	3
Destroyed by animals			1			1
Lost by tilting or loosening of nest		1	1			2
Failed to develop properly		1				1
One young fledged		1	1	2	1	5
Two young fledged	1	2	2	1	1	7

Though the initial figures in the table do not represent the entire number of pairs nesting in the area, they probably furnish

a fairly accurate index to the relative yearly abundance, with the possible exception of 1922, when the search for nests may have been less systematic than in succeeding years. 1924 and 1925 were exceptionally dry seasons, which may have caused the Hummingbirds to concentrate to an unusual extent in the irrigated districts. The Los Angeles rainfall records show that 1923 was also deficient in moisture, though a cool spring and heavy late rains along the foothills kept the wild flowers blooming well into the summer. In 1926 the precipitation was somewhat above normal, and in 1922 still more so. It will be observed that the net results in the various years were more nearly uniform than the original number of nests. Incidentally, I find no evidence in support of the belief that a Hummingbird prefers to return and build again on the site of its previous nest.

The totals in the above table show the number of young fledged to be almost exactly one-third of the number of eggs laid. While some of those whose eggs were destroyed undoubtedly built new nests, relatively few were found which had been started after the main nesting period in April or May. Unless results are more favorable in other localities, the small increase indicates that the Hummingbird must enjoy a long life for a creature of its size. As an offset to the destruction by teams or implements, which usually occurred at an early stage, a number of the nests were tied up to prevent their occupants from being spilled out by reason of the faulty construction previously alluded to. Lacking this assistance, the losses under that heading would certainly have been much larger. It is notable that in only one instance were natural enemies clearly responsible for loss. Although this nest was on a small limb about four feet from the ground and the young were killed during the daytime, strong circumstantial evidence in the shape of foot-prints pointed to the Spotted Skunk as the culprit.

Mr. Dawson's 'Birds of California' contains the information that Allen's Hummingbird, among others, rears two broods each year, while the Costa's and Calliope Hummingbirds have but one. Without desiring to discredit these statements, which may be based on the most careful investigation, it is hard to see why the more prolific species would not gain in numbers at the expense of the others, so nearly identical in structure and habits and subject to the same hazards.

None of the other species share the preference of Costa's Hummingbird for arid regions, nor breed so generally in the Lower Sonoran zone, to which the Costa's is largely confined. Anna's Hummingbird, according to Dr. Grinnell (*Distributional List of the Birds of California*), breeds almost entirely in the Upper Sonoran zone. Its breeding range lies wholly within the State of California and northern Lower California, while its migration is only partial and it is a common resident of all the more densely populated sections of the State, abounding in city parks and gardens. How fitting it would have been, then, if M. Lesson, instead of attaching to this species for all time the name of a member of the European nobility who probably never saw a live Hummingbird, had named it for the great province of which it is so characteristically a part! Perhaps even yet this splendid species might by common consent become officially known as the California Hummingbird; if so, the writer respectfully offers this suggestion to publishers of future handbooks and check-lists.

The Black-chinned Hummingbird is typical of the foothills and canyons of the less humid portions of the West, and is said to be more dependent upon the presence of water than any other species. That it can on occasion dispense with this desirable commodity was made evident to the writer upon meeting with this species in an Upper Sonoran canyon in southern Arizona at a time when, owing to unprecedented drought, the stream had long since run dry. Aside from a very few scattered mescals, there was an entire lack of flowers, in lieu of which the Hummingbirds were systematically probing the clusters of leaves at the ends of the live oak twigs.

The Broad-tailed Hummingbird, preëminently a mountain dweller, is a comparatively recent addition to the recorded avifauna of California, since the limited portion of the State in which it occurs is one of the least frequented regions in the United States. It seems reasonable to suppose that it may eventually be found as a migrant, at least, farther south in the mountains of eastern San Bernardino County.

The appearance of the Broad-tailed Hummingbird is not especially distinctive in any way. The color of the gorget, aside from its somewhat inferior brilliancy, is very similar to that of

Anna's Hummingbird, though showing at some angles a more purplish cast. A convenient recognition mark of the male is the rufous edging of certain of the tail feathers, in conjunction with the solid green color of the back and upper tail-coverts. It may safely be said that the Broad-tailed Hummingbird is much more readily identified by ear than by eye. The loud metallic noise produced by the flight of the male is an agreeable, almost musical sound, clearer in tone than that made by the Rufous, Allen's or Black-chinned Hummingbirds, while the notes of the female seem more liquid than those of other species. A rather faint, muffled staccato note is uttered twice in quick succession at the lowest point of its vertically diving nuptial flight.

To digress slightly from the subject at hand, the rather unusual distribution of the large genus *Selasphorus* is worthy of notice. In addition to the three wide-ranging North American species, the genus contains five species of small size, all of which are confined to the highlands of Costa Rica and western Panama. Since none of the northern species migrate farther south than Guatemala, there is no contact whatever between the two groups.

MENTALITY.

Few animals have aroused such widely divergent opinions regarding their mental capacity as have the Hummingbirds. By most naturalists, probably, they have been credited with a high degree of intelligence. It would seem, however, that many of the instances cited as evidence of reasoning ability, usually in connection with the construction of their nests, might as readily be assigned to accident or instinct. On the other hand, I believe that few observers will concur in the judgment of the late W. H. Hudson, who devoted a chapter of 'The Naturalist in La Plata' to a discussion of the characteristics of the Hummingbirds as a group, in the course of which, while greatly admiring their physical endowments, he classes them with the insects as to intelligence; in fact, in the case of the bumblebees, even to the advantage of the latter. Hummingbirds, says Mr. Hudson, "possess the avian body but do not rank mentally with birds. The pleasure one takes in their beauty soon evaporates, and is succeeded by no fresh interest, so monotonous and mechanical

are all their actions; and we accordingly find that those who are most familiar with them from personal observation have very little to say about them. A score of humming-birds of as many distinct species, are less to the student of habits than one little brown-plumaged bird haunting his garden or the rush-bed of a neighboring stream. . . ."

With all due respect to Mr. Hudson's eminence as a naturalist, one cannot but feel that his attitude was unusual—certainly far different from that of John Gould, author of the 'Monograph of the Trochilidae,' who says: "That our enthusiasm and excitement with regard to most things become lessened, if not deadened, by time, particularly when we have acquired what we vainly consider a complete knowledge of the subject, is, I fear, too often the case with most of us; not so, however, I believe, with those who take up the study of the family of Humming Birds. Certainly I can affirm that such is not the case with myself; for the pleasure which I experience on seeing a Humming Bird is as great at the present moment as when I first saw one."

Many of Mr. Hudson's arguments do not seem convincing. He says: "It has frequently been remarked that humming-birds are more like insects than birds in disposition. . . . Their aimless attacks on other species approaching or passing near them, even on large birds like hawks and pigeons, is a habit they have in common with many solitary wood-boring bees. They also, like dragon-flies and other insects, attack each other when they come together while feeding. . . . Again, like insects, they are undisturbed at the presence of man while feeding, or even when engaged in building and incubation; and like various solitary bees, wasps, etc., they frequently come close to a person walking or standing, to hover suspended in the air within a few inches of his face; and if then struck at they often, insect-like, return to circle round his head. All other birds, even those which display the least versatility, and in districts where man is seldom seen, show as much caution as curiosity in his presence; they recognize in the upright unfamiliar form a living being and a possible enemy."

The similarity of the Hummingbird's habits to those of certain insects unquestionably creates the impression of an equal similarity in mental traits. It is quite possible, however, that though certain

actions are performed mechanically by insects, the same actions on the part of the Hummingbird may be entirely volitional. Considering the difficulty of drawing definite lines of demarcation between reason, instinct and reflex action even in the case of one's own accustomed activities, it would be rash to make dogmatic assertions as to the psychology of so distantly related a creature as a Hummingbird; but it may be observed that the habits which it is said to have in common with insects are also shared to a greater or less extent by some other birds and mammals, so it would seem fair to assume that its mental reactions in connection therewith would most closely resemble those of the higher animals to which it is related. The matter of its attacks on other birds has already been discussed.

The Hummingbird's indifference to the presence of man, which as a matter of fact is by no means so complete as would be inferred, might be justified on the grounds of its quickness of movement and its comparative freedom from molestation. It is true that it resembles the insects in its apparent recognition of possible enemies rather through their movement than by their form, but this applies to a certain extent to most birds and many mammals, while on the other hand, those who have attempted to photograph Hummingbirds under various conditions probably will have discovered that they are sometimes quite as suspicious of unfamiliar objects, whether living or inanimate, as are most other birds—one female even refused to approach the nest and feed her young while the camera was standing about three feet away. And as to curiosity, if that is to be regarded as an indication of deficient mentality, naturalists must be assigned a very low position on the scale of intelligence!

To again quote Mr. Hudson: "Humming-birds often fly into open rooms, impelled apparently by a fearless curiosity, and may then be chased about until they drop exhausted or are beaten down and caught, and as Gould says, 'if then taken into the hand, they almost immediately feed on any sweet, or pump up any liquid that may be offered to them, without betraying either fear or resentment at the previous treatment.' " Mr. Hudson then cites the similar behavior of dragon-flies, and continues: "Only in beings very low in the scale of nature do we see the

instinct of self-preservation in this extremely simple condition, unmingled with reason or feeling, and so transient in its effects. The same insensibility to danger is seen when humming-birds are captured and confined in a room, and then, before a day is over, they will flutter about their captor's face and even take nectar from his lips."

In the comparison of the behavior of Hummingbirds and dragon flies, the true test would appear to be, not in their actions when first caught, but when again approached after being released. In such circumstances an insect would doubtless use exactly the same effort to avoid recapture that it had used in the first place, modified only by physical exhaustion. The action of the Hummingbird would be quite different, according to Mr. Hudson's own statement and many other accounts of the ease with which it may be tamed, a trait which it shares with no less sagacious a beast than the elephant, and which in itself would seem to imply a certain degree of intelligence.

Though compelled to admit that I have so far been able to detect no indication of the Hummingbird's possession of reasoning ability—an accomplishment which, after all, is rarely enough displayed even by the human race—and that it may be lacking in some of those finer emotions which make many of the birds seem so akin to mankind, nevertheless its actions and attitudes, its alert interest in its surroundings, its apparent love of sport and its ability to recognize those who befriend it, as attested by many writers, certainly furnish competent evidence of an acutely conscious intelligence. Suffice it to say, in conclusion, that the Hummingbird's equipment—physical and mental—is sufficient to enable it to maintain its numbers successfully with an unusually small potential annual increase, comparable in general only to that of certain birds and mammals of many times its size.

Azusa, California.

THE RUFFED GROUSE IN WINTER.

BY R. A. JOHNSON.

(Plates XVIII-XIX)

AMONG naturalists, sportsmen and conservationists, much serious consideration is at present being given to the Ruffed Grouse (*Bonasa umbellus*). The chief reason for this interest lies in the fact that the Grouse has become so reduced in numbers that sportsmen especially, but also naturalists and students of wild life generally, have become alarmed at the possibility that the species may be approaching virtual extermination, or at least that it may become so scarce as to require that it be taken off the list of birds that may be hunted. As to the causes for the apparent reduction of the species, little is positively known.

During the course of natural history studies of the Ruffed Grouse, conducted in northern New York, by the author, observations were made on the winter habits of this species. Note was taken also of any other facts observed in connection with the habits or life history of the Grouse no matter how trivial they might appear.

The range of the Ruffed Grouse may be considered as generally limited to the cold temperate regions which extend very far southward along the principal mountain ranges of the continent. Thus the range is everywhere in the woods from New England and eastern Canada north to the tree limits, west to Oregon and south along the mountain ranges to Georgia, Mississippi, and Arkansas. However, in the southern part of the range, birds are found only in the high altitudes.

The Ruffed Grouse, like most other forms of wild life, is relatively inactive during the severe winter season. The more severe the weather the less active the birds.

During the greater part of the day, throughout the season of cold, snowy weather, the Grouse remains quiet under a low branching conifer, in a snow burrow in the open, or hidden high in the boughs of an evergreen. This habit might be termed day roosting. The places chosen by the birds for this day roosting are not different from those chosen for a night berth. The Grouse is often

reluctant about leaving these roosting places, especially on dark or stormy days. At such times they will remain quiet while one passes within a few feet of them, but if one stops very near the hiding place, even for a very short time, he is likely to be startled by the sudden whirr of the wings as the bird moves to other parts.

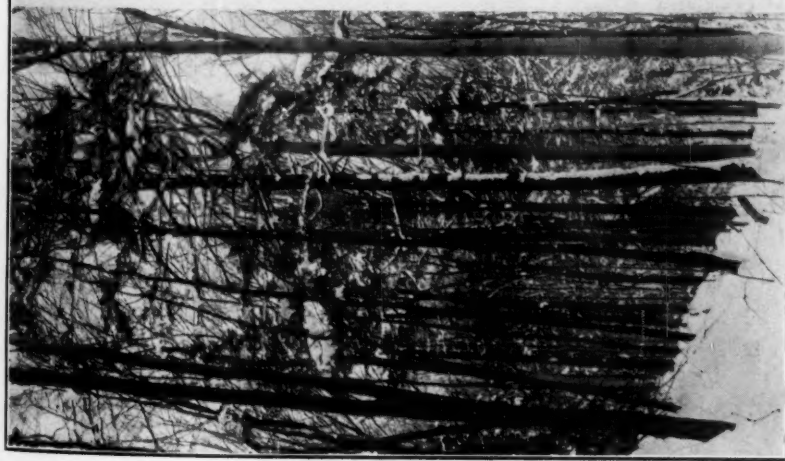
A bright sunny winter day seems to be welcomed by the Grouse as it is by most all creatures of the wilds. On such days, especially after a number of dark, stormy ones, the birds will come from their snow bed to find a quiet, partially protected perch in a conifer where they may expose themselves to the rays of the sun. Such perches are usually in a low tree which the bird has approached by walking from the snow bed to within a few yards of the tree before flying up among the branches. By following back along such a trail, one may find, frequently, under a snow-banked evergreen, the roosting place from which the bird ventured in order to enjoy the sunshine.

In severe weather the Grouse feeds in the very early morning, and in the late evening just before dark. In northern New York where the ground is covered with snow during the greater part of the winter season, all observations indicate that buds and catkins form the greater part of the winter food of the Grouse. Needles of hemlock, and arbor vitae are sometimes taken as food. Frequently, birds are observed feeding on catkins high up in the birch trees, where, by aid of the wings they climb from one branch to another, gathering the food within reach.

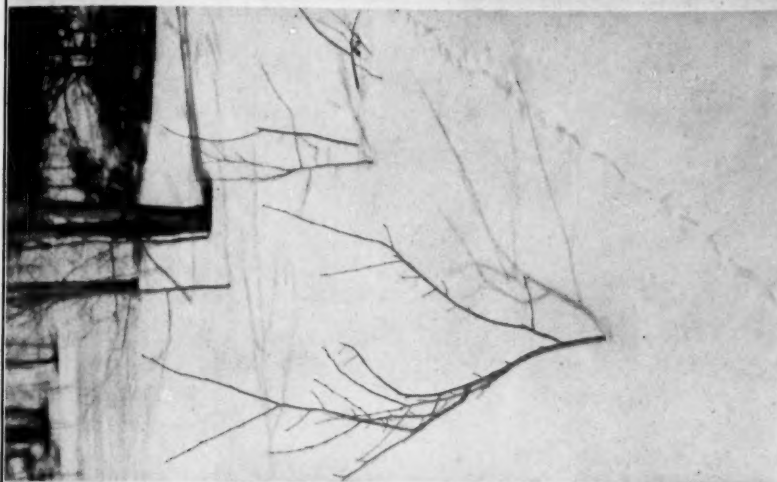
The Grouse chooses to roost alone. The bird may select a dense evergreen and seek a perch in the thickest part, well screened from the weather and its natural enemies. However, in severe weather after some snow has accumulated, it favors a berth in the snow.

In general these snow beds may be said to represent three types. They are thus classified according to their nature and surroundings:

(1) The snow burrow, formed when the Grouse chooses a location in an opening in the woods, or on a slope, and plunges into the loose snow, there forming a nest-like bed completely below the surface. Upon leaving the bed the bird flies directly out never to return to the same burrow. These burrows range in depth from eight to sixteen inches and are directed into the snow at some angle between 45 and 90 degrees.



1. ROOSTING PLACE OF GROUSE IN
HIGH HEMLOCKS.

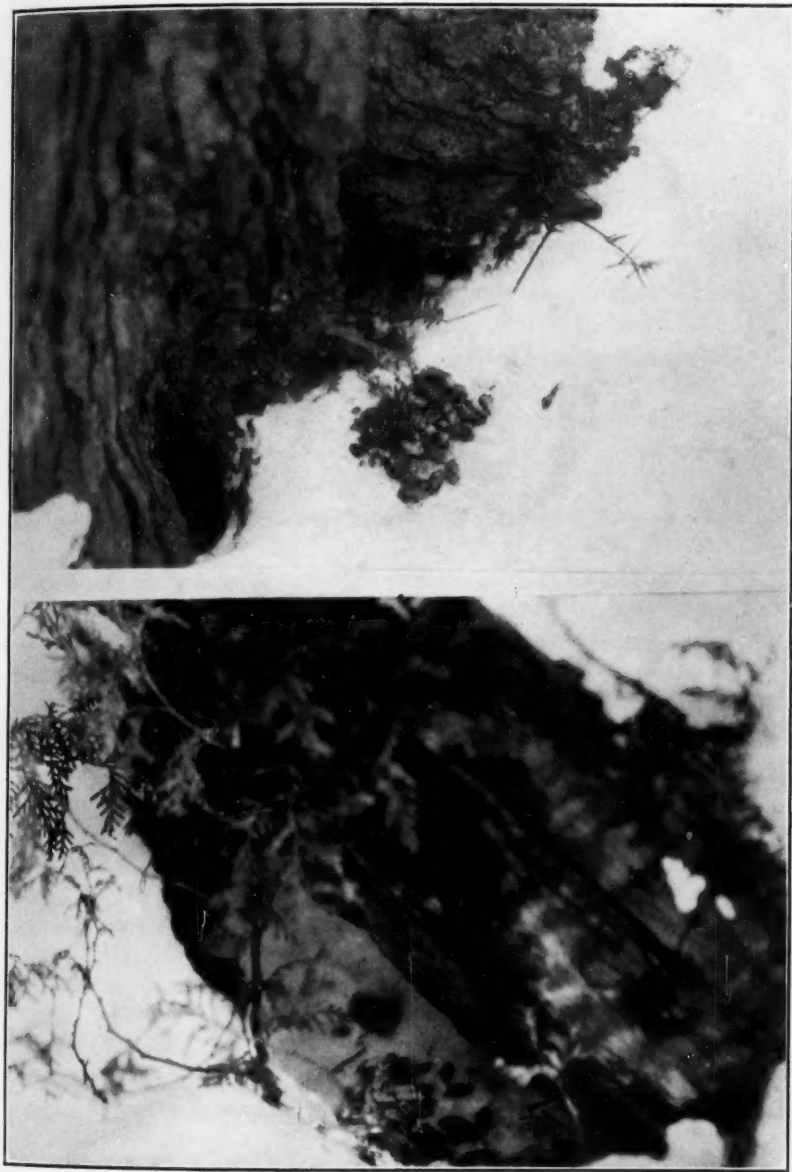


2. GROUSE TRACKS IN SNOW.



3. FAECES OF GROUSE IN SNOW BED
AT BASE OF TREE.





1. CAMOUFLAGE SNOW BED AT BASE OF STUMP.
2. WHERE GROUSE SOUGHT SHELTER FOR THE NIGHT. DIFFERENCE IN CHARACTER OF FECES SHOW THAT SHELTER WAS USED AGAIN AFTER FEW DAYS INTERVAL.



(2) The concealed snow bed, usually under the snow banked branches of an evergreen, rarely under a log or leaning stump. This type of bed is merely a sitting place on the surface of the snow, and resembles a rabbit form. The bird may walk into and out of such a bed, but once settled for the night, it does not shift its position very much.

(3) The camouflage snow bed is located at the base of a stump or tree. It seldom conceals the occupant below the surface of the snow but the dark color of the bird is blended with the dark color of the tree or stump, thus tending towards concealment while at the same time some protection is offered from the wind. This type of bed is often used after the snow has settled, or when an old snow has settled and there is a light, shallow snow on top and when the weather is rather clear.

The flight of the Grouse is very swift. While the bird usually rises with a thunderous roar, it seems to have the ability to get under way at times with very little noise. Often it rises on a curve so that the gunner is likely to shoot under it, and when well under way flies straight ahead out of sight. When flying from an elevated position in a tall tree, the bird seems to curve down for a few yards, thus getting an easier take-off. At such times it usually flies in a straight line and makes very little noise in making the "get-away."

Like all other gallinaceous birds, it spends a great part of its life on the ground. The major part of its activity is that of walking and running. Although as shown by the tracks, which are very close together, the bird covers only a few inches of ground at a step, it can move its feet very rapidly. Very commonly the Grouse runs rapidly ahead of the dog and in thick woods is able to escape the hunters.

It is a common belief that the Grouse because of small horn-like scaly outgrowths along the lateral sides of the toes, thought to be special adaptations, is able to walk on top of the snow. Although very probably these adaptations are of some advantage in this respect, they by no means enable the bird to walk on loose snow.

An interesting characteristic, shown by the tracks, is that as the bird moves forward one foot is placed in direct line and immediately in front of the other.

Manlius School, Manlius, N. Y.

THE DESIGNATION OF BIRDS' RANGES.

BY JOSEPH GRINNELL.¹

Linné, in 1758, stated of a certain bird: "Habitat in America septentrionali." The geographic idea is here exemplified, in its simplest terms, namely, by country, indefinitely.

A greater degree of explicitness, but still involving the purely geographic concept, is illustrated in the A. O. U. Check-list, second edition, 1895, where the distribution of a certain bird is given as: "Rocky Mountain region, west to the Pacific coast; north to British Columbia, and south to Mexico and the West Indies." Here are used regional names as designating outlying or peripheral positions of occurrence; the cardinal directions are employed to advantage.

A great expansion of this peripheral method is to be found in Ridgway's "Birds of North and Middle America" which is so well known to my readers as to make it unnecessary to cite an example. Not only general political areas are given, but usually a series of towns or cities. The positive usefulness of the method has been amply demonstrated by practice. But even if useful in practice, the designation of animals' and plants' ranges by the employment solely of geographic place names has a serious failing, in that it rarely gives any indication of *cause* of delimitation. The correlation of occurrence of a species with certain climatic, topographic and floral peculiarities of the territory exclusively occupied by it is an exceedingly significant one. For no one will deny that the species is controlled, and not only that but directly modified through time, by environment; in other words, the evolution and persistence (versus extinction) of species is bound up in the evolution, multiplication and persistence (versus elimination) of areas of relatively uniform environmental conditions. These areas comprise the ranges or habitats of animals.

Now it is true that this important concept has been incorporated by very many systematists in more or less measure in their designations of birds' ranges, along with the purely geographical terms. The reader will recall such phrases as the following: Inhabits the southern moister sections of; dry western plains; humid Pacific

¹ Read at meeting of the American Ornithologists' Union, Pittsburgh, Pa., Nov. 13, 1924.

coast strip; treeless areas; sandhill region of southwestern Kansas; blue-oak belt of the Sierras; mangrove swamps; tundras; etc., etc. Any of these phrases is more or less helpful toward the expression of significance in occurrence; but such phrases are usually vague and rarely come anywhere near setting forth the full situation. There is needed some thoroughgoing classification of both world and local areas, based upon the critically important factors bearing upon the existence of living things, within them, and involving appropriate names that can be used in defining the ranges of both plants and animals.

In a recent article in 'Science' (LVI, Sept. 22, 1922, pp. 336-338) the herpetologist, E. R. Dunn, deals with this subject under the title "A Suggestion to Zoogeographers." He sets forth many of the difficulties pertaining to such systems of habitat designation as that by regions, realms and faunas, that by life zones, and that by plant formations. He calls zoologists sharply to task for not casting about in other fields for possible tools to work with, and then proceeds to set forth the advantages of using physiographic regions, these as having been described and named for the United States by Nevin M. Fenneman (Annals Assoc. Amer. Geographers, VI, 1916, pp. 19-98, pl. 1 [map]). Dunn's arraignment made me prick up my ears (as it were), and I went right after Fenneman's article and map. But, I found no such exact definition, in Fenneman's Major Divisions, Provinces, and Sections, and no such close correlation with the distribution of birds and of mammals, at least in the West, as Dunn would lead one to expect. An example from Fenneman will serve to explain this physiographic method of mapping and naming: Berkeley, California, lies within what he terms the "Pacific Mountain System" Major Division, within the Pacific Border "Province," and within the California Coast Ranges "Section." A contemplation of birds and mammals in that particular part of the United States shows such rare coincidence in their ranges with the areas outlined as to convince me of the altogether *non-significance* of this physiographic system with respect to animal speciation. The potent factors of climate do not come in for recognition at all.

I had several talks with Dr. C. O. Sauer of the Department of Geography, University of California, on this general topic of range

designation, and found that he and his associated geographers have adopted, as the basis for their study of cultural distribution geographically, a system which they feel is the most significant yet proposed, based upon an analysis of climates. It will be accepted by everyone, of course, that man forms no exception to the rest of the animal kingdom in his dependence upon the critical factors of environment for existence and persistence; that he has been, and is, molded in his physical form, in his habits, and in his mental attributes by quite the same influences as control the course of evolution of other mammals.

The best presentation of this climatic basis of habitat designation to date is that (which I was directed to by Dr. Sauer) by Professor W. Köppen, of Hamburg, entitled (translated) "Classification of climates according to temperature, precipitation, and annual march" (Petermann's Geogr. Mitteilungen [Gotha, Justus Perthes], 1918, Sept.-Oct.-heft). This last factor of climate, the "annual march," while thus third in sequence of enumeration and of probable importance, is nevertheless of great bearing upon plant and, therefore, upon animal existence. It involves the alternation of dry and wet seasons, of cold and warm seasons, of variable versus relatively uniform climates. It has to do with the botanists' "associations," many of them. "Precipitation" is, of course, one phase of humidity.

Köppen has classified the climates of the world on a sound quantitative basis of meteorological data, and his map sets forth this classification with names of areas for the whole world, often taken from dominant plants or general vegetational features. For North America the scale of the map is too small to admit of much practical adoption of his names. But with the accumulation of meteorological data here and the plotting of it on Köppen's scheme, which I understand is under way, we shall soon be provided with an adequate set of named areas for bird range designation on the really significant, climatic basis.¹

In this connection it will be a satisfaction to some of my readers, as it has been to me, to observe that the gist of C. Hart Merriam's

¹ Since the above was written the following important contribution upon the subject has appeared: R. J. Russel, 'Climates of California', Univ. Calif. Publ. Geography, vol. 2, October 22, 1926, pp. 73-84, colored map.

life-zone tenet, temperature control, is now receiving confirmation upon the basis of a vastly greater accumulation of meteorological figures and distributional facts than were at his disposal 25 to 35 years ago. Also, as I have pointed out many times, the most useful system of range designation must also recognize humidity, that is, rainfall, as a controlling factor, as S. F. Baird and J. A. Allen long ago contended; and then the plant formations, "associations" of the modern ecologists, also must come into the scheme. I cannot help here referring to the work of Chapin on African birds as meeting, in his distributional treatment of species, what appear to me to be about the most thoroughly high standards to date.

To summarize: A distinct advance in bird range designation over the strictly topographic one, by political province or place-name designation, is that incorporating in greatest practical detail the facts of climatic control. Ranges of species should eventually be set forth, especially in such standard, authoritative lists as the A. O. U. Check-list, in terms of climatic areas, these being mapped and appropriately named on the basis of temperature, of rainfall, and of annual march. In the present stage of development, until such locally detailed maps are available for the United States, the synchronous use of the life-zone system, the system of faunal subdivisions of life zones, the system of associations, and the concept of the "ecologic niche" [all of these, be it noted, in combination] will serve us most exactly and *significantly* in defining the modes of occurrence of species. To repeat, my plea is for the most phylogenetically significant system of designating birds' ranges.

*Museum of Vertebrate Zoology, University of California,
Berkeley, Calif.*

TUBINARES OFF THE NORTH-WEST COAST.

BY JOHN TREADWELL NICHOLS.

DURING a five weeks cruise on the steamship "Victoria" between Seattle, Wash. and Nome, Alaska, this summer (1926), several observations on birds of the Petrel group were made which seem worth placing on record, though no specimens were secured.

Fulmarus glacialis glupischa and **F. rodgersi**. **FULMAR**.—The largest number on July 11 in Shelikof Strait, about 800, the dark phase to light phase about as 99 to 1. Still plentiful but in much smaller numbers further west off the Alaska Peninsula the following day when 1 pale phase and 1, the only, intermediate bird noticed,—dark with a white head. When observed elsewhere in the Pacific the dark phase outnumbered the pale phase about 9 to 1.

Near Unimak Pass pale and dark birds were in about equal number. Elsewhere in Behring Sea the Fulmar was present but nowhere numerous, almost all pale phase;—a dark bird well over towards Bristol Bay, and 2 or 3 to about 56° 20' N., north of Unimak Pass. As regards *rodgersi*, the pale birds were variously all gray to almost entirely white above, scarcely any one like another.

Bent¹ has suggested that *rodgersi* is merely individual variation of *glupischa*, and that dark phase Fulmars in both oceans are distinct having a somewhat different range. My observations bear out both these views, though of course range at sea is of much less significance than breeding range. Crossing the Atlantic in late September 1922, in 5 days from 51° 08' N. 18° 32' W. to 43° 49' N. 51° 04' W., (noon positions) pale phase Fulmars were present each day, but it was not until late on the last day that 2 or 3 dark phase birds appeared.

Ordinarily (except in a gale) the flight of the Fulmar looks rather heavy and clumsy, and it flaps its wings a good deal. I was therefore surprised on August 4 at sea (noon position 54° 36' N. 153° 43' W.) to find that some 10 of them following in the ship's wake were sailing almost continuously. There was a moderate breeze blowing from just forward of the starboard beam and we were making about 12 knots. I watched sailing birds for 4 and 4½ minutes, until they flapped for the first time. In the 4½ minutes, the last mentioned crossed back of the ship's stern 15 times. It is my memory that therein only its flight differed from that of the truly sailing species, that its cousin the Cape Pigeon of the south seas for instance would have sailed a straighter course.

Puffinus bulleri. **NEW ZEALAND SHEARWATER**.—With a fresh breeze blowing more or less behind us, two of these birds followed in the steamer's wake for a short time on the morning of August 7. We were off

¹1922. Bull. U. S. Nat. Mus. cxxi.

the coast of British Columbia bound southeast, and our noon position $50^{\circ} 21' N. 130^{\circ} 15' W.$; the point where they were noted, the most northerly record for the species, therefore more or less to the north and west of this.

They did not come very close, but the pattern of their plumage could be seen readily enough, gray above, outer primaries and band across secondaries blackish, underparts and under wing entirely pure white, white and dark on side of head contrasted in a sharp line suggesting the Greater Shearwater, and their flight also seemed more like the flight of that bird than any other that comes to mind. The primary portion of the wing, as well as the tail seemed relatively long, and their size smaller than I would have supposed from measurements. Size in distant birds at sea is very deceptive with nothing for direct comparison, but presumably this Shearwater is rather small bodied.

***Aestrelata fisheri*.** FISHER'S PETREL.—Seen in the Pacific, on one day only, August 5, when midway between the islands and the west coast, noon position $53^{\circ} 36' N., 145^{\circ} 37' W.$ They were frequent all day, singly and in small groups, a conservative estimate for the total number, 30.

They frequently rose well above the water, and when flapping their wings at such an elevation might easily have been mistaken in the distance for some small Gull; gliding about close to the surface they suggested the smaller Whale Bird (*Prion*) of the South Seas, and occasionally one was seen twisting erratically as though 'goaded on by a gadfly,' flashing its silver-white and black under-wing pattern. The lower surface of the wing showed mostly white but with a conspicuous and contrasting black edging the exact position of which it was not easy to place in the flying bird.

As these birds frequently came within fair binocular range, and as Fisher's Petrel has recently (it seems correctly) been referred to plumage variation of Peale's Petrel,¹ I am tempted to give a more detailed description than would ordinarily be worth while from 'field-glass' data. Large headed birds with long primary portion to the wing, short tail, bill distinctly of the *Aestrelata* type, black. Forehead, throat and under tail coverts white. Belly dark gray, usually appearing blackish, sometimes not quite so dark. Upper parts lighter gray of about the tone of the Fork-tailed Petrel; outer primaries and stripe continuing across secondaries black or blackish, secondaries immediately behind this stripe whitish. Eye spot blackish; side of head apparently a somewhat darker gray than upper parts. There was variation in the dark color on the side of the head; in some individuals it was continuous with the gray of the upper parts; in one, distinctly limited behind by a narrow cross mark of white; and in 1 or 2 more distant birds apparently limited above also, for they appeared to have a broad dark band from eye to auricular region.

Other species observed on the cruise were Black-footed Albatross; Slender-billed Shearwater (concentrated in very large numbers in Unimak

¹ Bent, 1922, Bull. U. S. Nat. Mus., cxxi, p. 117.

Pass; of the Sooty Shearwater I have no satisfactory identification, but am of the impression that it replaced the generally common Slender-bill farthest off shore at a point midway between the islands and the coast, and to some extent at least on the east side of the Gulf of Alaska; Fork-tailed Petrel; Leach's Petrel, only off the British Columbia coast, common August 6 and a few August 7 (noon positions $52^{\circ} 19' N.$ $137^{\circ} 42' W.$ and $50^{\circ} 21' N.$ $130^{\circ} 15' W.$), presumably *O. l. beali* (Emerson).

Amer. Museum of Natural History,

New York, N. Y.

THE FEEDING RANGE OF CERTAIN BIRDS.

BY WILBUR K. BUTTS.¹

INTRODUCTION.

DURING recent years a vast amount of information has been collected regarding the range, migration, breeding habits, and nature of the food of nearly all our common birds. There is, however, very little known concerning problems connected with the life of individual birds. How long a bird lives, how fast it travels in migrating, whether the individuals of a resident species present in the winter are the same as those present in the breeding season, are questions about which we still know very little. Likewise we know little about the feeding range of individual birds. Bird banding has just begun to throw some light on these questions. Many observers have spent hours near the nests of birds determining the kind and amount of food brought to the young, but few, if any, have noted where the food has been procured. As F. C. Lincoln, in an article on "The History of Bird Banding,"² remarks, "The distance that birds range from their nests foraging for food has never been determined."

Some information concerning the winter feeding range has been gained by Mr. S. Prentiss Baldwin in his bird banding operations near Thomasville, Ga.³ This investigator found that with traps set about one hundred yards apart "repeaters" (birds returning again and again to the traps) were rarely taken more than one trap away from their usual station, showing that their range was surprisingly restricted.

Bird banding operations were conducted at Thomasville in 1923 by T. E. Musselman.⁴ In order to determine how local was the distribution of the birds he was catching, Mr. Musselman took one

¹ A contribution from the Ornithology Laboratory at Cornell University.

The author is indebted to Mr. E. L. Palmer for assistance in banding birds; to Mr. R. T. K. Cornwell of the Department of Chemistry, Cornell University, for suggestions on the use of dyes; to H. A. Metz and Co., New York City, and Dupont de Nemours and Co., Wilmington, Del., for samples of dyes; and to Dr. A. A. Allen, for assistance in banding birds, helpful suggestions, and critical reading of the manuscript.

² 'Auk,' 1921, pp. 217-228.

³ 'Proc. Linn. Soc.' N. Y., 31, 1919, pp. 23-26.

⁴ 'Auk,' 1923, pp. 448-450.

trap from its usual position and placed it half a mile beyond the last of his line of traps. Here daily catches were large, but scarcely any new birds were taken. Nearly all were Chipping Sparrows which had been banded during the first week of his operations, and which had moved, either because of a desire for different food, or because of the flocking instinct preparatory to leaving for the north. But few of these birds returned to the principal string of traps. The trap was later taken two miles away. Here only one haul was made, catching 15 or 20 birds. These were all new.

One particularly interesting case showing restriction of winter feeding area, is told by Dr. J. B. May who carried on bird banding work near Thomasville in 1924.¹ A Brown Thrasher, which was named "Peg Leg" because of a missing left foot, was caught several times during the winter in one of two traps. Finally the bird was taken to Thomasville, about two miles away, to be photographed. At the door of the studio "Peg Leg" escaped, and disappeared in the tops of the trees. Eight days later it appeared again at its old haunts. Thereafter it repeated at frequent intervals in one of two nearby traps, never going to others a hundred yards or so from its favorite roosting place in an old wisteria vine.

W. L. McAtee of the Biological Survey also expressed the opinion that birds do not travel far while on their winter feeding grounds. In a note on "The Search for Food by Birds"² he remarks, Birds go over the same places. Various birds have more or less regular beats which they cover approximately on schedule. Their system of food-finding is to look everywhere in their domain, searching all day every day in the comparatively restricted area to which they appear to confine themselves.

By far the most important work on the local movements of birds has been done in England by H. E. Howard. He says in the preface to his book "Territory in Bird Life"³ "When studying the Warblers some twenty years ago, I became aware of the fact that each male isolates itself at the commencement of the breeding season and exercises dominion over a restricted area of ground. Further investigation, pursued with a view to ascertaining the re-

¹ 'Auk,' 1924, p. 459.

² 'Auk,' 1920, pp. 341-344.

³ London, 1920, John Murray Publisher.

lation of this particular mode of behavior to the system of reproduction led to my studying various species, not only those of close affinity but those widely remote in the tree of avian life."

Since Howard's work has an important bearing on the present investigation, a brief summary of the more important of his findings is herewith given.

(1) At the beginning of the breeding season each male seeks out a favorable locality for the attainment of reproduction, and, occupying a limited area, isolates itself from its companions. This area, over which it exercises dominion, is known as its territory.

(2) The boundaries of such territories are in some cases remarkably definite, but they should not be thought of as lines definitely delimiting an area of which the bird is cognizant. The territory is established on the principle of habit formation. After seeking out a suitable environment each male, in response to its inherited nature, finds a place unoccupied by any other male, and settles in it. The bird then soon wanders away from the position in search of food, and returns. Presently it wanders away again, perhaps in another direction, but as before, works its way back again to headquarters. It repeats these journeys, and thus gradually forms a habit which compels it to remain within more or less well defined boundaries. The actual distance it travels must be determined to some extent by the abundance of food it is seeking.

(3) Each male keeps all other individuals of the same species, and, in some cases other species, away from its territory by fighting.

(4) Having thus established a territory the male proceeds to sing, usually from certain conspicuous posts, almost always within the territory, thus warning other individuals away, and advertising the fact that he is ready for a mate. If the males sing during migration or before establishing a territory, they are not then in full song.

(5) The females arrive on the scene later and seek out the singing males.

(6) The advantages to the species of such a system are many. Among the more important are these. It insures that the species will be evenly distributed over all the breeding grounds. It provides that the females can easily find the males at the proper moment. Finally, it insures an adequate supply of food in close

proximity to the nest for which the pair will not have to compete with other individuals.

(7) Each pair however does not necessarily obtain all its food within its territory. In case of the Guillemot, for example, which nests in colonies on cliffs, and has but a few square feet of territory, the principal object in establishing a territory is to secure a suitable nesting site, rather than to exercise dominion over a certain feeding area. At the other extreme there are certain Warblers which find plenty of room for their nests, but which must have an abundance of food close at hand. Since the young at birth are so delicate and susceptible to changes in temperature, the parents cannot afford to be absent from them long. Such birds obtain all their food within their territory. There are other species which obtain part of their food within the territory, and at times resort to common feeding grounds.

METHODS.

The method used for determining the feeding range of the birds in the present investigation was to trap and mark them so that the different individuals could be identified at any time. A record was kept of the places where these individuals were seen, and in some cases their movements were followed in order to determine just how much ground they covered.

Eighty one birds of the following species were marked:—Downy Woodpecker 3, White-breasted Nuthatch 7, Chickadee 14, Junco 15, White-throated Sparrow 1, Song Sparrow 14, Tree Sparrow 26, Robin 1. A few unmarked birds which could be identified by their nests were also studied.

The trap used at the winter feeding stations was of the inverted tray type which drops when released by a pull string. Later on small automatic cage traps, which operate by the bird stepping on a platform thus releasing the door, were used. These proved much more satisfactory, as several traps could be operated at the same time, and they did not have to be closely watched by the operator.

The location of the trapping and feeding stations where the birds were watched for, is shown on the map, p. 338.

Permanently marking the birds so that they could easily be identified at any time proved to be the most difficult part of the

problem. Bird bands as supplied by the Biological Surveys are of value for identification only when the bird is recaptured. For this reason, in addition to placing aluminum bands on their legs, an attempt was made to paint or dye the feathers. The idea of painting birds is not a new one. It was, in fact, used before bird banding was undertaken. F. C. Lincoln, in an article on "The History of Bird Banding,"¹ remarks, "The earlier investigators marked their birds in a variety of ways, such as dyeing or staining the flight or tail feathers, attaching memoranda written on parchment, or mutilating feathers, feet, or bill."

Ernest Thompson Seton, in a note in "The Auk" for October 1921,² also mentions marking some Snowflakes with printer's ink.

A number of experiments in coloring have been carried on by the Department of Ornithology at Cornell University for several years. Various organic dyes and colored India inks were tried but none proved to be sufficiently permanent when applied to living birds. A paint with turpentine as a base was used on one occasion, but this became gummy or sticky on drying, so that the feathers were matted together, leaving a bare spot on the breast of the bird. Consequently in the present investigation no paints of this nature were used for fear of causing injury to the bird. For the same reason mutilating the feet, bill, or feathers was not tried.

In order to test the permanence of the various stains, feathers of the domestic fowl were colored, allowed to dry, then soaked in water over night, and thoroughly washed. Those which still showed a fairly good color after this treatment, were then exposed to sunlight, wind, and rain until they faded. The more permanent colors were then tried on living birds. As a general rule the colors faded somewhat more quickly on living birds than they did on the test feathers exposed to the weather.

The following substances were tested:—silver nitrate, iodine, picric acid, indigo, carmine, congo red, methyl blue, methyl green, Hoffman's green, orange G, saffranin, gentian violet, indanthrene blue B, anthraflavone GC, thio indigo red B, indanthrene golden orange G, pontamine yellow, pontamine red, acid fuchsin, basic fuchsin, and artists' oil colors mixed with carbon-tetrachloride.

¹ 'Auk,' 1921, np. 217-228.

² 'Auk,' 1921, p. 611.

Alcohol was used as a solvent for all dyes which would dissolve in it. If insoluble in alcohol, water was used, and the feathers were first washed with ether, alcohol, or carbon-tetrachloride to remove the grease.

In addition to being stained the bird was recorded by banding with the standard aluminum leg bands furnished by the Biological Survey.

Of all the stains tested, basic fuchsin and artists' oil colors mixed with carbon-tetrachloride proved the most satisfactory, and these were the only ones used to any extent on live birds. The length of time which the colors remained bright varied considerably with different individuals and different species. The following table indicates the length of time the colors lasted on some of the birds marked.

Species	Stain used	Length of period in days	Condition of color at end of period
Tree Sparrow	Artists' Oil Color	9	Bright
" "	Fuchsin	15	"
" "	"	16	Faint
" "	"	22	Bright
" "	"	23	Very faint
Chickadee	"	18	Faint
"	Artists' Oil Color	52	"
Junco	" " "	14	"
1 Downy Woodpecker	Fuchsin	11	Bright
1 " "	"	34	Very faint
1 " "	"	54	Practically gone
2 Nuthatch	"	10	Bright
2 "	"	26	"
2 "	"	42	Very faint
3 "	Artists' Oil Color	32	Bright
3 "	" " "	61	Very faint
3 "	" " "	90	Gone

Those with the same numbers are observations at different periods on the same individual. The length of the period is the time which elapsed between staining and recapture. In some cases

where the individuals were easily recognized, recapture was unnecessary to determine the condition of the color. "Bright" indicates that the color was almost as distinct as when applied, so that the bird was conspicuous and would immediately attract one's attention. "Faint" indicates that the color had faded considerably, but was still distinct enough to easily identify the bird. "Very faint" indicates that the color had so far faded that it could not be seen except under favorable conditions. Birds with the color very faint could still be identified if watched closely, but the color would not be noticed unless the observer were looking especially for it.

From the above table it may be seen that the color could not be depended upon to be bright enough to attract one's attention for more than ten days or two weeks after application. It is very desirable to have the color conspicuous enough to attract the attention of other observers so that more data may be collected. The color, however, was sufficient for the purpose of identification for at least three weeks in every case.

In order to obtain a more permanent method of marking, some colored leg bands were devised. Mr. C. L. Whittle in a note in 'The Auk' for 1925, p. 136, mentions the coloring of the standard aluminum bands by means of Diamond Dyes. After staining, the bands were varnished. The color, however, wore off within thirty days. Acting on this suggestion, some colored bands were made by cutting pieces of celluloid out of a small tray, purchased at the ten cent store, boiling them in some dyes for a few moments, and then bending them into the proper shape while still hot. The bands thus made were a little wider than the standard aluminum bands, in order to be more easily observed, but were used in the same manner. As they would not bend as easily as aluminum bands, they were harder to adjust on the leg of the bird, but after a little experience in preparing them, satisfactory results were obtained. Birds thus banded were also stained. After two weeks on a Song Sparrow, the colored band served as a much better means of identification than the color on the feathers. After a month the color near the lower edge of the band was somewhat worn off. The band served as a satisfactory means of identification throughout the nesting season. Doubtless bands could be manu-

factured of colored celluloid which would serve for the entire life of the bird.¹

It might be well to state here that in most cases the birds did not appear to be in the least injured by the application of the colors. A Tree Sparrow painted at one station was the first bird to be caught at another station about fifty yards distant, twenty minutes after he had been stained. Whenever a bird was watched after being colored and banded, it was observed to sit quietly for fifteen or twenty minutes, drying and preening its feathers, and attempting to remove the band. It usually appeared to be more worried about the band than about its brilliant plumage. It would soon begin to feed about with other individuals, which took no notice of the strange appearance of the colored bird. In two instances the birds appeared to be somewhat overcome either by fright or by the fumes of the carbon-tetrachloride in the stain. They remained on the ground for several minutes after being released before flying slowly away. Subsequent captures of both of these birds, however, proved that this condition was only temporary. Only one case of possible permanent injury occurred. A female Song Sparrow, which had been incubating for several days, did not return to the nest after being stained, and entirely disappeared from the neighborhood. Inasmuch as it had been handled in exactly the same manner as the other eighty birds which suffered no injury, it may well be that its disappearance was due to some other cause.

Since completing this work a paper has been received from Dr. Rudolph Drost telling of some bird coloring experiments in Germany.² This author was able to produce a stain with which he colored birds so that at the end of seven weeks the color was still as bright as on the day it was applied. Unfortunately he does not state what substance was used. He merely states that the mixture contained certain organic solvents which dissolved the oil and enabled the color to penetrate the horny substance of the feathers. Letters of inquiry to Dr. Drost were not answered.

¹ cf. also Burkett, 'Brit. Birds,' xvii, 295.

² 'Ornith. Monatsber.' March, 1925.

OBSERVATIONS ON THE WHITE-BREADED NUTHATCH
(*Sitta carolinensis carolinensis*).

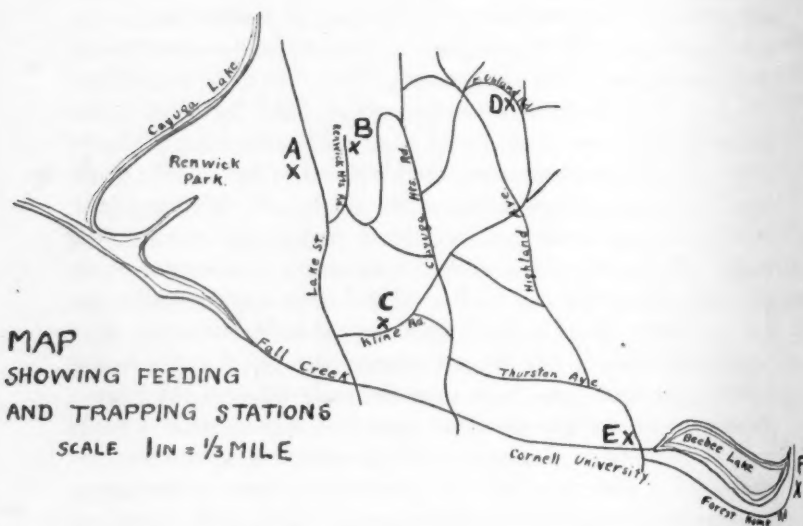
The first point noticed in the investigation of this species was that the birds are almost always found in pairs. This habit has been noticed by other observers. E. D. Sanderson, writing of the Nuthatch in Michigan,¹ says, "The birds are invariably found in pairs. In only one instance did I find half a dozen together on a river bank which doubtless were several pairs. The timber in this neighborhood consists of small lots of a few acres, and each of these will ordinarily be occupied by only one pair of Nuthatches."

In the present study nine pairs in the area under observation, about two square miles, were found. There may have been others. The first week in April a flock of about eight Nuthatches was reported. This was very likely a group of migrating birds, as they were not seen again in the neighborhood. Occasionally single birds were seen. In most cases these were birds which had temporarily become separated from their mates, and were calling loudly. It was frequently noticed that when a pair became separated the male would call loudly. The female would usually take her time before flying in the direction of the male, but would eventually seek him out. It did not appear, however, that the female followed the male any more than the male followed the female. In starting on a flight across an open field sometimes one would go first, sometimes the other. While searching about for food during the winter they kept up a continual chatter of low notes, presumably in order not to get separated. This made them easy to follow. During the nesting season, however, they were more quiet, but at the same time much more active, so that it became extremely difficult to keep up with them.

In the course of the study it soon became apparent that each pair did not wander freely about, but had a definite, restricted, though fairly large feeding range. No Nuthatch was reported at a feeding station other than the one at which it was trapped, with the exception of a pair which went freely between stations A and B. These, however, were only 300 yards apart. (See maps, pp. 338, 339.) As a rule only one pair fed regularly at each station, although others paid occasional visits.

¹ 'Auk,' 1898, p. 145-148.

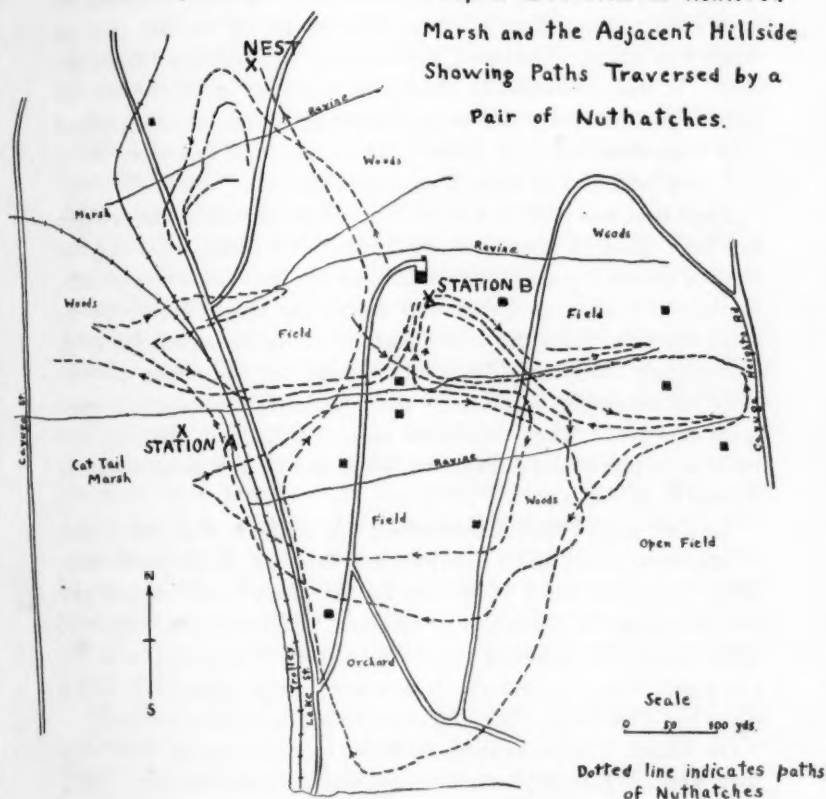
The map (p. 339) shows the principal paths travelled by a pair which were trapped in January, 1925, and stained red on the breast. They were recaptured several times, and restained each time, so that the colors served for identification throughout the period in which they were under observation. The total time spent on their trail was seventeen hours on different occasions between February 1 and April 15. The longest period of continuous observation was for six hours on February 24. It was not



possible to plot on the map all the paths traversed during the entire seventeen hours without greatly confusing it, and so, in the main, only those which indicate the amount of ground covered are shown, the remaining paths being largely within the region south-east of station B. This area was evidently their headquarters, as it served as a starting point for their journeys, and was a place to which they returned again and again. It may be that the nest of the previous year was located here. In addition to the time spent in actually following the birds, they were seen many times at the feeding stations A and B, and at various points within their range as indicated on the map. Apparently the birds kept more

to the southern part of the range at first but increased the area covered to the northward on the approach of spring. The total area to which the birds confined themselves was about 48 acres, about half of which is covered with a growth of mixed hardwoods,

Map of a Portion of Renwick
Marsh and the Adjacent Hillside
Showing Paths Traversed by a
Pair of Nuthatches.



the remainder being open fields with rather thickly scattered oaks, elms, and locusts. The ground slopes steeply to the west, and is crossed by several small ravines.

It may be noticed that the birds were not observed in the area shown in the northeast corner of the map, although this was suitable feeding ground. It may be that, by chance, they did

not wander in that direction when under observation, but more likely it was because that section was the territory of another pair which was seen there once, and which occasionally fed at station B. Still another pair of Nuthatches occupied the wooded region to the west of the map. This pair never fed at station A so far as known.

That the birds were active in the defense of their territory, at least after the approach of spring, was shown by the fact that on April 4 a strange Nuthatch approached their territory from the east. It was immediately chased by the pair along the eastern edge of their territory to a point somewhat beyond where they had ever been observed to go before. Here the chase was abandoned, and they returned to more accustomed paths.

Their nest was built in a knot hole in a white oak on the extreme northern limit of their previously observed range. During the nesting season it was extremely difficult to follow their movements, as they seldom uttered their call notes, and would frequently fly some distance from the nest before starting to search for food. Accordingly one could seldom follow them far, and it was not possible to determine accurately the maximum distance travelled from the nest. They were once seen 800 ft. from the nest and twice were followed a distance of 600 ft. as well as shorter distances a number of times.

Another pair of Nuthatches which was studied inhabited a strip of woodland about half a mile long and from 100 to 200 yards wide, along the south shore of Beebee Lake. They were trapped and stained orange on the breast at station F. They were not reported from station E, although they were observed to feed just across the street from it. Station E was used for photography, and if these birds fed there, they doubtless would have been noticed.

On March 6, while near the extreme eastern limit of their territory, another pair of Nuthatches approached from the east. They finally flew into the same tree where the female of the orange-stained pair was feeding. The male was a short distance away, too far to be able to see the other birds, although he must have been able to hear them. There was no fighting. After a few moments the unmarked pair flew off in the direction from which they had come. The observer followed them and found that they occupied an area to the east of the orange-stained pair.

On March 24 the orange-stained pair, when somewhat outside of their usual feeding range, again encountered two unmarked Nuthatches. Both pairs fed together peaceably for several minutes in the same grove of trees.

These two instances would seem to indicate that Nuthatches are not active in the defense of their territory during the winter, but it may very well have been that, since in both cases they were at the extreme limit of their observed range, the birds did not consider that their territory was being invaded.

On April 13, after several days of warm weather, the orange-stained pair chased another Nuthatch along almost the entire southern edge of their territory as far as the western end. Here they turned back and started feeding as usual.

The orange pair nested near the center of their winter feeding range. Another pair stained green at station C in January also nested in the vicinity of the feeding station. Three pairs of Nuthatches, then, banded between January 9 and February 13, nested not far from the station where they were captured. Six other pairs observed during the winter, but which were not banded, were still present, with possibly one exception, at the beginning of the nesting season, the last of April; or at least birds occupying the same territory were present. No Nuthatches were seen in the spring which were not accounted for by the winter records, with the exception of the flock of eight previously mentioned. Therefore it seems probable that all individuals of this species which winter in this locality are permanent residents, and therefore that the birds which are only summer residents farther north spend the winter south of Ithaca.

Dr. W. M. Tyler¹ also tells of a Nuthatch which was apparently permanently resident at Lexington, Mass. The same bird, or one which he supposed to be the same bird, came to his feeding shelf practically every day for over a year with the exception of an interval between June 6 and 16, 1914.

OBSERVATIONS ON THE CHICKADEE
(*Penthestes atricapillus atricapillus*).

Evidence regarding the feeding range of this species is somewhat conflicting. While following the Nuthatches in the vicinity of

¹ Wilson Bulletin, 1916.

stations A and B during February and the early part of March, a flock of about six Chickadees, most of which had been banded at stations A and B, were frequently in evidence. For perhaps one fifth or one sixth of the time when under observation the Nuthatches and Chickadees were together. This flock, or a portion of it, could nearly always be found in the neighborhood. When attempts were made to follow them, they were found to keep to the same general range that the Nuthatches did. They were more difficult to follow, however, and long continued observations were not made. In April the flock broke up. At least one banded pair, probably stained early in March, nested in the neighborhood.

On the other hand, there are some records of Chickadees being reported at stations at some distance from the one at which they were stained. A bird stained December 19 at station A was seen December 25 and several times during January at Station D, having travelled a distance three-fourths of a mile of semi-wooded country. Another Chickadee, or possibly the same one, stained at station A December 19 was seen about a week later at station C a distance of half a mile in almost the opposite direction.

One banded pair, probably captured during January at station C, nested in a hole in a telegraph pole about one fourth of a mile from this feeding station.

Four Chickadees stained at station F were frequently seen in the vicinity during February and March and two of them were still present in the breeding season.

The fading of the colors which distinguished the birds hampered getting more complete and reliable data on this species.

Inasmuch as at least three pairs nested within or near their winter feeding range, while others were apparently only winter residents, it seems reasonable to suppose that the permanently resident individuals had a restricted feeding area, while those which came to this region in the fall or early winter wandered about for a time before settling down in an area near a feeding station. On the other hand, the flocks may have been family groups, each consisting of a pair with the young of the previous season, the young ones leaving during April to nest elsewhere.

One of the marked Chickadees was first banded by Dr. A. A. Allen on March 7, 1921, and was recaptured at the same station

six times on the following dates:—March 7, 1921; April 29, 1921; December 21, 1922; December 2, 1923; February 18, 1924; January 25, 1925.

OBSERVATIONS ON THE DOWNY WOODPECKER
(*Dryobates pubescens medianus*).

The case of the Downy Woodpecker is similar to that of the Chickadee. A flock of five or six were frequently associated with the Chickadees and Nuthatches. One of these was banded November 8, 1924 at station B but was not painted until January 17, 1925. It was seen about a dozen times between January 17 and April 17, and was followed for five or six hours. It apparently stayed within the same area occupied by the Nuthatches and Chickadees and possibly nested there.

OBSERVATIONS ON THE TREE SPARROW
(*Spizella monticola monticola*).

It was not found practical to follow individuals of this species for any length of time. They were wary and would usually soon disappear in a tangle of weeds or cat-tails. Twenty-two individuals were stained at stations A and B during December, January and February. Between these two stations 300 yards apart they appeared to travel freely. All but eight were recaptured at least once, some of them five or six times, at station A or B. One of them, banded January 10, was recaptured January 27 at station C half a mile away. With this exception no stained birds were ever seen except in the immediate vicinity of the station where captured. Tree Sparrows were abundant in the marshes to the west. Numbers of stained birds could always be found in the immediate vicinity of station A. How much their apparent restriction to one locality may be due to the presence of the feeding stations we may only surmise, but it is not thought that the presence of the feeding station had very much influence, because the food was not kept at the stations continuously. Marked birds were still around when food had not been put out for a week.

OBSERVATIONS ON THE JUNCO
(*Junco hyemalis hyemalis*).

Like the Tree Sparrows these birds could not be followed long. Twelve individuals were stained during January and Feb-

ruary at station F where they inhabited a thick growth of young pine trees. During February and most of March, marked birds could always be found in the immediate vicinity, and were never seen farther than 100 yards from the feeding station, thus indicating that their winter feeding area was quite restricted.

Mr. C. L. Whittle and L. B. Fletcher¹ report that out of fifty-seven Juncos banded, many repeated frequently at the same station, but only one was ever taken at another station, although there were three other stations within two miles. Fourteen of the banded birds returned the next year to the same station.

These same investigators also report that the Goldfinch wanders freely about from place to place. Recoveries at one station of birds banded at another are matters of nearly every day occurrence.

OBSERVATIONS ON THE SONG SPARROW

(*Melospiza melodia melodia*).

There are not sufficient data to draw any conclusions regarding the winter feeding area of this species. One individual, however, stayed in the vicinity of station A from December 19 until March.

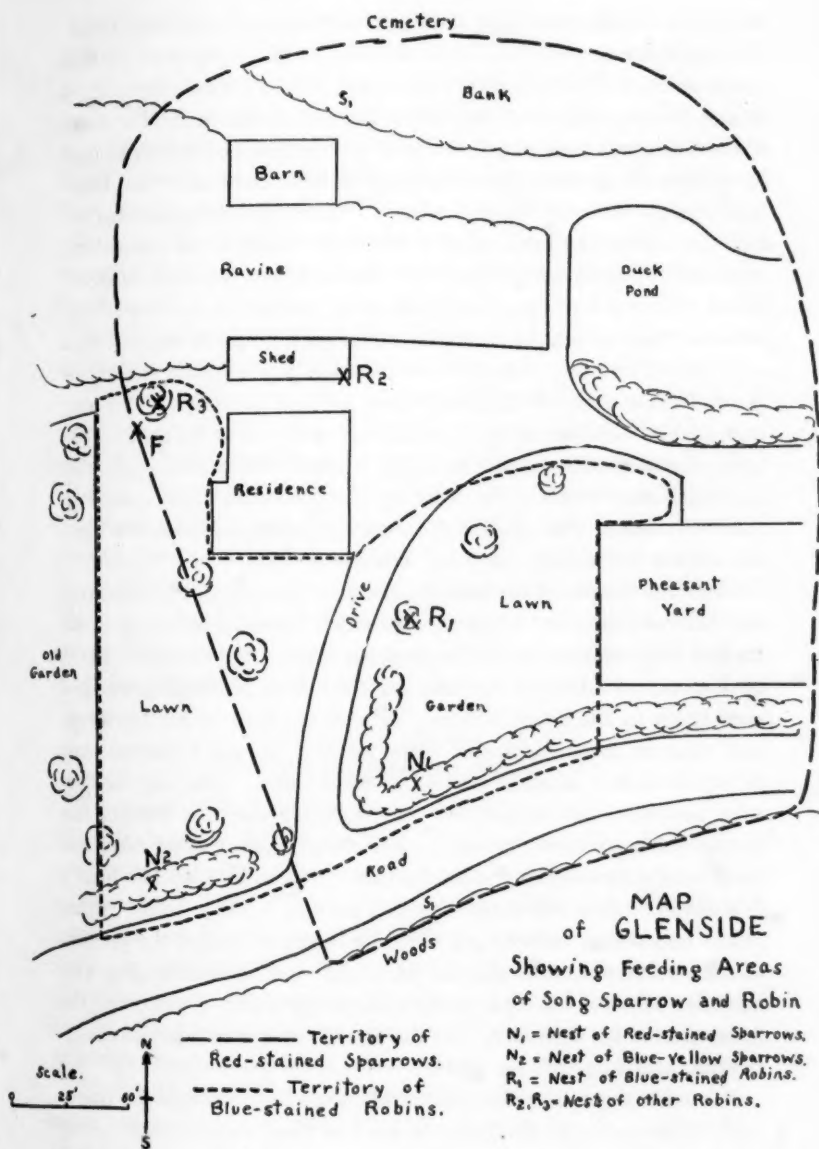
During the nesting season two pairs offered an interesting problem in the study of bird territories. Their nests were built in a low hedge of spruce one hundred feet apart. Each pair had a definite feeding area which was not encroached upon by the other pair. Unfortunately the behavior of the birds while establishing their territories was not observed, as the study was not begun until the nests had been built and the eggs laid.

The male of one pair was stained red on the right side, and provided with a red celluloid band on the right leg to serve for identification in case the color on the feathers faded too quickly. The female of this pair was stained red on the left side, and provided with a white celluloid band on the left leg. For convenience we will call this the red pair.

The male of the other pair was stained blue on the breast, and provided with a standard aluminum band. The female was stained orange on the breast, and provided with a yellow band. For convenience we will call this the blue-yellow pair.

As shown by the map (p. 345) the boundary line between the

¹ 'Auk,' 1924, pp. 327-333.



territories of the two pairs was just half way between the nests. The behavior of the birds while feeding on the lawn close to this line was carefully observed. This boundary must not be thought of as a distinct line which was never crossed by the birds, but none of the birds was seen to go over into the territory of the other pair for a distance greater than four or five feet, until after the blue-yellow pair deserted their territory. They fed a great deal on this portion of the lawn, and were under observation for several hours on different occasions. Occasionally the two males hopped about within a foot or two of each other beneath a shrub midway between the two nests. Each always stayed between his own nest and the other bird. Once while thus feeding beneath the shrub the red male apparently transgressed a little too far, and he was attacked by the blue male. As the red male stood his ground the fight ceased almost as soon as it had begun. On another occasion the red female was driven away by the blue male from a feeding station (marked F on the map) on the boundary line between their territories, but usually they fed there peaceably.

After the female of the blue-yellow pair was caught and stained, she did not reappear at the nest to finish incubating her eggs, although she had been in the trap not more than five minutes. This bird, as explained in the discussion of the effects of staining, was not seen again in the neighborhood. Her mate kept to his territory, and sang as usual for about three weeks. It was expected that he would obtain another mate, but none came. One day he flew over near the nest of the red female, while she was feeding her young, perhaps to try to entice her away. He stayed near her for several minutes but she paid no attention to him, and he finally flew away. The red male was not present at this time. After about two weeks without his mate he began to desert the portion of his territory nearest the red pair, and soon he was singing and spending most of his time in the old garden which constituted the lower part of his territory. At the end of three weeks he too disappeared, and was seen no more.

For a few days after the blue-yellow male had deserted the upper part of his territory, the red pair kept to their accustomed feeding grounds. Soon, however, they increased their area until it included all that of the blue-stained male. Soon after the blue-

stained male had entirely disappeared, the three young of the red pair left the nest. Two of them made their way into the old garden which had formerly been the territory of the blue-stained male, while the third went in the opposite direction. Thereupon the red male ceased singing in the vicinity of his nest and began to sing in two places, one in the old garden where two of his fledglings were hidden, and one in the upper part of his former territory where his other fledgling had wandered. Thereafter the old birds searched for food not far from the young instead of in their old territory.

It would thus seem that after the young had left the nest the territory was in the vicinity of the young.

As shown on the map, the territory of the red pair was bounded on the south by the edge of the woods, and on the north by the territory of still another pair which inhabited the cemetery. To the east it was not sharply delimited. Once the female wandered a distance of 100 yards up the ravine in this direction. The total area of the territory of the red pair was about 7000 square yards, a part of which was taken up by buildings and a small duck pond. The area available for feeding was about an acre. The extent of the territory of the blue-yellow pair was not ascertained before they disappeared.

OBSERVATIONS ON THE ROBIN

(*Planesticus migratorius migratorius*).

Three pairs of Robins were under observation at station C. Only one pair, however, fed on the lawn. The nest of this pair was in a small spruce tree near the southeast corner of the house, as shown on the map (p. 345). The female was stained blue, and although the male was not captured and stained, for convenience we will call them the blue pair. The other two pairs fed in the ravine or in the cemetery to the northward. Once the blue female was observed to chase an unmarked female from the lawn near the tree in which the unmarked one was nesting.

The blue pair obtained most of their food from the lawn and the adjacent roadside, an area of 2,500 square yards or a little more than half an acre. They also fed at times across the road in an old field which had recently been burned over. This field, how-

ever, was not a part of their territory, since at least two other pairs also frequented it.

When the young left their nest they made their way into the woods across the road. Thereafter the parents searched for food to some extent in this woods, but for the most part still came back to the lawn. One of the young wandered a short distance down the road to the edge of a lawn in front of a neighbor's house. On this lawn its parents could easily have obtained food, but instead they always flew back to their old haunts to find a tender morsel for the youngster. The neighbor's lawn was doubtless the haunts of another pair on whose territory they did not attempt to trespass.

When able to begin to take care of themselves, the young birds fed partly in the woods and partly on the lawn frequented by their parents.

This lawn was also the feeding grounds of the two pairs of Song Sparrows already mentioned, several House Sparrows, and a Bantam hen with three chicks.

The nest for the second brood was placed in a tree overhanging the road. Time did not permit the carrying of the study further.

That Robins may on occasion travel some distance, is shown by the report of a Robin which was seen by A. H. Norton¹ crossing a passage of water between an island and a point, a distance of half a mile, carrying nesting material. Mr. Norton also says that on another occasion a Robin was under observation for nine hours one day and again nine hours the next day, during which time it occupied a section of the yard not exceeding 50 x 100 feet. During these eighteen hours, the bird was not out of sight for more than two minutes at a time, thus indicating the narrow limits within which it remained.

SUMMARY.

1. White-breasted Nuthatches travel in pairs throughout the winter.
2. Each pair has a definite winter feeding territory.
3. The winter feeding range of one pair of Nuthatches under observation was 48 acres, about half of which was wooded. The

¹ Bull. Essex Co. Ornith. Club, 1923.

range of another pair was about 25 acres, nearly all of which was wooded.

4. Three pairs of Nuthatches under observation nested within their winter feeding territory.

5. Nuthatches range at least 800 ft. from the nest in search of food.

6. Most, if not all, the individuals of the White-breasted Nuthatch wintering near Ithaca, N. Y., are permanent residents.

7. The data regarding the winter feeding ranges of the Chickadee and Downy Woodpecker are not conclusive, but apparently their ranges are similar to that of the Nuthatch.

8. Some of the individuals of the Chickadee present in winter are permanent residents.

9. The daily feeding ranges of Tree Sparrows and Juncos in winter are quite restricted.

10. The territory occupied by one pair of Song Sparrows under observation during the nesting season was 7,000 square yards, of which about one acre was available for feeding. They obtained practically all their food within this area until the young left the nest, when they followed the young.

11. The territory of this pair was restricted by the presence of another pair of Song Sparrows occupying an adjacent territory, and was enlarged when the neighboring pair disappeared.

12. The territory occupied by the pair of Robins under observation consisted of a lawn and roadside with an area of 2,500 square yards. They obtained most of their food within this area, but at times resorted to common feeding grounds. They continued to hunt most of the food for the young within this territory even after one of the young had moved 150 yards from the nest into another equally good feeding area. In this respect they were quite different from the pair of Song Sparrows.

CONCLUSION.

Since this study occupied a period of only six months, and was confined to a few individuals, any comprehensive statements, other than those given in the foregoing summary, cannot be made. We may say, however, that the results are in accord with Howard's theories concerning the part territories play in bird life. It is

evident also, that the method of study by marking individuals with stains or with colored bands opens up promising fields for future investigation.

*1343 Montrose Avenue,
Bethlehem, Pa.*

NOTES ON THE BIRDS OF SOUTHEASTERN ALASKA.

BY ALFRED M. BAILEY.

(Concluded from p. 205.)

Asio flammeus. SHORT-EARED OWL.—One was killed on the Peterson ranch near Mendenhall Glacier, March 49, and was taken to the local taxidermy shop, where I saw it. I took two birds on the outer Beardslee Island, Glacier Bay, on June 16, and saw four others August 15 on the same island. Three were collected.

Cryptoglaux acadica scotaea. NORTHWESTERN SAW-WHET OWL.—These little Owls are not common; at least they are rarely met with. I saw one on Forrester Island the evening of July 17, and a young male was collected near Mendenhall Glacier sometime during September. I saw the bird in the local taxidermy shop. I am told that small Owls are fairly common near the Mendenhall Glacier.

Bubo virginianus saturatus. DUSKY HORNED OWL.—I saw one on Douglas Island Jan. 9, and a female was collected near Sandy Cove, Glacier Bay August 13. I saw another on the Mendenhall River October 18, where I am told they are common in the dense woods. Rudy told me these birds never bothered his poultry. This species is probably more common than the few records submitted would indicate, as the woods are heavy, and the birds are rather secretive.

Glaucidium gnoma gnoma. PYGMY OWL.—Gray has taken a good series near Wrangell in the past eighteen years, but said the species will be entirely lacking for several years at a time, then again he will see half a dozen during a year. Willett wrote me he took a female at Sea Otter Harbor, Dall Island, August 24, and a male at Wrangell October 20. He wrote,—“If the race *swarthi*, described by Grinnell some years ago proves distinct, these birds probably would be referable to it. Of course, I have had no opportunity to compare my specimens with others from the States.”

Ceryle alcyon caurina. WESTERN BELTED KINGFISHER.—These birds are generally distributed and are to be found along all favorable channels. Their rattling cry is the characteristic note in Keku Strait, and they are often heard off in some secluded nook; they are much more abundant throughout the southern islands, say from Wrangell to the southward, than they are near Juneau. I saw but one there during the winter, while Willett told me they are fairly common the year around at Craig. I did not see these birds during the summer, or if I did, I failed to place the records in my notes. Several were seen daily in Keku Strait November 16–20, 1919; one was seen at Juneau January 11, and a female in Oliver Inlet February 8. One was working in Dry Pass March 7, and

several were noted at Craig March 9-11. Several were seen at Wrangell April 11-18, and one on Farm Island April 19. In the fall, one was observed along McGinnis Creek September 17, another in Seymour Canal September 29, while several were observed October 26-27 at Kootznahoo Inlet.

Dryobates villosus harrisi. HARRIS'S WOODPECKER.—Woodpeckers of any species proved very scarce, in spite of apparently favorable conditions, such as a mild climate, dense woods, and one would imagine, abundant food. This species was not common among the northern islands, for I have but two records for the vicinity of Juneau, both birds being seen January 14, and a male collected. Willett states they are more numerous about Craig, where he secured a good series. I saw one on Kupreanof Island March 5, a male, and a male was collected in Hooniah Sound May 21, and another heard the same day.

Dryobates pubescens subspecies. DOWNY WOODPECKER.—Only two birds were seen, one at Montana Creek, near Mendenhall Glacier on September 17, and the other on Mt. Robert, at about one thousand feet elevation, on September 23. As I did not secure a specimen, I am unable to say to which subspecies they are to be referred.

Picoides arcticus. ARCTIC THREE-TOED WOODPECKER. As with other woodpeckers, these appear but stragglers, and were only seen at Juneau on April 7. I was climbing up the side of Mt. Juneau, at an elevation of 1500 feet when I collected the first, and another was taken a few minutes after, in the same vicinity. Both were males.

Picoides americanus americanus. AMERICAN THREE-TOED WOODPECKER.—This species is not abundant but more were seen than of any other form, and specimens were taken throughout the islands. Two were noted at Wrangell March 1 and a female collected, and two others were seen April 13, and another female taken. Three male birds were collected near the mouth of Patterson's Bay, Hooniah Sound, May 9-20 and 24 respectively. These birds did not approach *fumipectus* described by Grinnell from the same general region (1907 Alexander Expedition). On June 9 I found a pair nesting in a dead hemlock, at Salmon Creek, near Juneau. The nesting cavity was about 20 feet from the ground and newly made. I carefully removed a section of wood, and was disappointed to find but one egg. While we worked about the foot of the tree, the female kept flying back and forth, occasionally alighting within a few feet of our heads, and then going to the nesting hole, where she would watch us. She entered freely, apparently with no idea that she might be revealing her nest. A male was taken on Mt. Robert September 23, and another was seen above timber line on the mountains of Lemon Creek, as it was resting on a dwarfed hemlock.

Sphyrapicus ruber ruber. RED-BREASTED SAPSUCKER.—This species was seen but once, a male which I collected on the Mendenhall River June 3. Hasselberg told me he has seen them on Admiralty Island.

Colaptes cafer saturator. NORTHWESTERN FLICKER.—Only four birds seen, the first at Wrangell November 26, 1919, the second above timber line on Mt. Robert, as it was flying down channel September 9, the third at Salmon Creek September 11, and the last recorded at McGinnis Creek September 17.

Chaetura vauxi. VAUX'S SWIFT.—I saw but one Swift, presumably of this species, on June 21, when near the Salmon Creek Bar just above Juneau. Apparently their range does not extend as far north as Juneau, in any numbers, at least.

Selasphorus rufus. RUFOUS HUMMINGBIRD.—These handsome little "winged jewels" were first seen at Hooniah Sound May 18, when a male was observed in the woods about one hundred yards from the beach. It darted through the underbrush with great speed, looking for all the world like a large bumblebee. I collected a male May 20, and a few others were seen daily in that vicinity, until we left May 24. I saw two birds at Juneau June 9. A nest was found on Point Couverton June 11, containing two eggs nearly ready to hatch. I was walking along the base of a precipitous cliff when I noticed the handsome little male hovering over my head, about twenty feet up, and was then surprised to see him climb into a nest, in the terminal branches of a drooping spruce. When incubating, the little male squatted far down in the nest, with tail and beak pointed almost vertically, and he proved so tame that I believe I could have touched him. As the nest was so difficult to get to, it was necessary to hang on to a rope with one hand, and draw the limb in with the other. The species was next seen on Forrester Island July 17, and none was noted after that date. I failed to make summer records for many species which were probably common, for my itinerary took me from their favorite haunts. Mr. Gray claims that the Calliope and Allen's Hummingbirds appear at Wrangell, and that he has taken specimens which he absolutely identified. It is unfortunate that he did not save some specimens, for he is undoubtedly a good observer, and at least is sincere in his belief of having seen them.

Empidonax difficilis difficilis. WESTERN FLYCATCHER.—This species is probably more numerous than my few notes would indicate, for its habits make it more or less difficult to find. Its plaintive, sweet little voice is the most conspicuous thing about it, and that is pitched to such a fine, delicate tone that one would not notice it, unless listening for bird music. I do not know of a more pleasing sound than their quiet call coming through the great woods, mysteriously as though from nowhere, and yet, from all directions. They were fairly common on Forrester Island, and were either seen or heard every day from July 9 to 21; by "fairly common" I mean one would expect to see or hear a few in a day's walk, and not that the species occurs in any numbers. One was seen on the shore of Glacier Bay August 15, and the last recorded from Granite Creek, near Juneau, at an elevation of 2500 feet, September 10.

***Pica pica hudsonia*. MAGPIE.**—These birds are fairly common in winter, but they evidently leave in summer time for their breeding grounds to the northward and the interior. They were numerous in Taku Harbor, Wrangell and Keku Strait November 15–28, 1919; only a few were noted near Juneau in January, but they were common in Oliver Inlet February 3–9, where they proved a nuisance to trappers, as they were continually stealing bait and snapping traps. A flock of a dozen or more might be seen sailing along the beach, against the wind, the whole flock settling on some point for a few moments, only to drift farther on immediately. They seemed restless individuals. A few were seen at Wrangell February 25–March 2, one at Craig March 11, and one at Wrangell April 13, the last recorded for the spring months. The first fall records were made at Grande Isle, Stephens Passage, September 25, when nine were seen; two were observed at Sumdum September 27, one on Douglas Island October 7, two in Canoe Pass, October 10, and finally, at Kootznahoo Inlet, October 26–27, they proved common. From that date, they were generally distributed along the southern coast.

***Cyanocitta stelleri stelleri*. STELLER'S JAY.**—Jays are fairly common and are to be noted the year around, although, naturally, they are more conspicuous in winter, when their beautiful plumage is so in contrast with the white of drifting snow. This species, like the former (Magpie), usually hangs about the villages, and one or two pairs are always about Indian camps. Two pairs remained about our camp in Hooniah Sound, and they could be heard the first thing in the morning as they jumped about among the leafless alders, and imitated the Crows and Ravens; they are very good impersonators, and it is often impossible to know whether a Crow, Jay or Raven is doing the calling. To give dates for their records would be mere repetition for they are common locally throughout their range. They have a habit of sitting quietly on a limb, close to the main crotch where they are hard to observe, and if one happens to be standing near, they gaze with apparent curiosity, and then, as though unable to stand still longer, let out a strident cry which will cause the most steady individual to jump. They are robbers of the first order, and steal anything edible about camp. I do not know whether we are able to give birds credit for a sense of humor, but if we do, then the Jays surely must come in for first place. I have watched a pair of these fellows tease a spaniel. They would alight in a path, only to be chased away by the dog, and they kept returning so often as to completely exhaust him; then, when the dog refused to chase them longer, they would alight over his head and talk to him,—undoubtedly they were cursing him, until he finally got up and walked away. The same performance was carried on daily. This species is not particularly in favor among hunters, for when one is quietly crossing a muskeg in the hope of jumping a deer, it is the usual thing to have a couple of Jays open a serenade, and then keep just ahead of the hunter, talking all the time.

Corvus corax principalis. NORTHERN RAVEN.—Common the year round. One could scarcely spend a day outdoors without seeing a few, so definite records of their occurrence need not be given. They are especially numerous in winter about the villages, where they pick an easy living around the slaughter houses and docks. Mr. Gray told me he once found a pair nesting on an unscalable cliff, but I believe the majority nest in trees in this region. I saw old birds carrying food high up on Mt. Robert, near Juneau, on March 18, as though they might have young, although it must have been too early in the season. This species was common near our camp in Hooniah Sound during May, and I found a nest high up in a dead spruce in which there were undoubtedly young, as the adults made continuous trips with food. There was a small pond near the base of the tree which was lined with crab shells. Ravens were common on Forrester Island, and Willett found a nest with half grown young in June; young birds were about camp daily in July, and Willett said he had seen young birds on the wing by May 13. This species will usually be found near large bird colonies, where they prey upon the nesting inhabitants; they are bold about their depredations, often driving the parents from their eggs, or stalking solemnly about until an uncovered egg is found. They usually hold the egg by the small end, when flying with it, although they sometimes stick their beaks through to get a better purchase. They rarely eat the eggs where they find them, but fly away to some convenient perch.

Corvus caurinus. NORTHWESTERN CROW.—This species is even more common than the preceeding, and is to be noted the year around. Crows are especially numerous about the towns and villages, hanging about the camps for food. At low tide, the flocks repair to the flats, where they secure an easy living among the mussel beds. It is a common sight to see Crows darting in the air, as they drop mussels upon rocks, to break them. If the wind is blowing, they allow for the curve, and usually do not make many misses in their endeavor to hit a certain boulder. They are probably the best imitators of their family in Alaska, and the variety of their notes is unusually large. Their most characteristic one is noted when the old bird is feeling especially foolish, for they duck their heads toward their feet, and then give an upward tug, at the same time emitting a sound like the pulling of a cork from a bottle. They are very tame, and soon become accustomed to having one about. They assemble in large flocks during winter, when they are working the beaches for food, but in summer they are more intent on family matters and do not feed in such bunches. I found a nest in Patterson's Bay, Hooniah Sound, May 17, which was about twenty feet from the ground in a small hemlock. The nest was a rather bulky affair of spruce twigs, lined with dried grass, while the interior cup was composed entirely of deer hair. There were four eggs in the nest. Crows were abundant on Forrester Island, and it was there that Willett called my attention to a peculiar habit of theirs, that of nesting under boulders on the beach. They placed their nests far back

in rather inaccessible places. Willett found one nest with eggs May 25. These birds too, are especially bad about plundering the nests of their neighbors and no species is safe from them, for they are continually hunting, possessing a boldness even greater than the Raven. They rob the sea birds nesting under boulders as well as the Murres upon the cliffs. They are not so conspicuous in their plundering however, as the Ravens, for they eat their eggs where they find them, and so probably put their time in to better advantage.

Euphagus carolinus. RUSTY BLACKBIRD.—I saw but one bird, and that near Wrangell January 4, 1921. Willett saw one two days before, and took two males back of Wrangell, in a marsh October 10, and saw another on the edge of town Nov. 30. Wrangell is an ideal place for bird study, as many species use the Stikine River as a migration route.

Pinicola enucleator flammula. KADIAK PINE GROSBILL.—Nine specimens were taken in the vicinity of Juneau during January. A small flock of females was seen January 13 along the Government trail, and another in Gold Creek Basin the next day. Males and females were equally divided as to number, and this flock, of possibly forty individuals were strung out over the hillsides on Mt. Robert, from about two thousand feet elevation down to creek bed. They were feeding on cranberries. The birds collected were slightly smaller, with weaker and longer beaks than a single specimen which I took up the Cooper River, near Chitina in December 1919. Six specimens were collected at Juneau January 11–14, and a flock of eight females, or young males were seen within the town limits of Wrangell February 27. Mr. Gray said these birds had been in the same locality all winter; three were seen in the woods next day. Grosbills were next seen in Glacier Bay, at the head of Berg Bay June 17; a couple of small flocks were working a short distance in the woods in the morning, and in the evening a few were noted among the alders, near the beach. Two were seen on Admiralty Island, near Twin Points, September 30. They were at timber line. Mr. Taylor reported eight in his yard at Wrangell December 29, and they reappeared about Juneau January 25, 1921, when about twenty-five were seen up Gold Creek. A male was taken. Seven birds were collected from a flock of similar size in the same locality February 1, and about forty were in the town limits the next day. The last recorded were on February 3, in Silver Bow Basin, about five miles back from salt water; three males were collected from a flock of about forty.

Loxia americana sitkensis. SITKA CROSSBILL.—These beautiful birds are fairly common during the winter and spring months among the southern islands, but only two were seen in the vicinity of Juneau during January, and these on Mt. Juneau at an elevation of 2000 feet. They were numerous on Admiralty Island during February (3–9), and a female taken at Oliver Inlet had well developed ovaries. Crossbills were common at Wrangell February 25–March 2, and four birds were taken. My notes read "Kupreanof, Dry Pass, Craig, March 3–11, abundant."

At Wrangell, April 11-18, they were seen daily, but not as abundantly as the month previous. They were also noted daily in Hooniah Sound, near Patterson's Bay. My only fall record is a flock of a dozen birds in a jack pine on Point Retreat, Admiralty Island, on October 28.

These little fellows are extremely industrious, and when feeding, are usually in large flocks; they are as likely to be seen along the beach, among driftwood, as high in the trees, according to my experience. They fly in compact flocks, and when one decides to move, the whole flock whirls away. Because of their irritating way of hanging in a tree when shot, they are difficult to secure, and I had to climb for most of my specimens.

***Loxia leucoptera*.** WHITE-WINGED CROSSBILL.—This species is not as abundant as the preceeding. Several small flocks, of possibly, a dozen individuals each, were seen near Juneau, on Mt. Juneau, January 14, another small band was noted at Salmon Creek January 28, and a few were seen at Oliver Inlet February 4. These birds were very wild. One was collected from a small flock March 29, on Douglas Island; several little bands were flying about on this date, swirling through the fast flying snow, from one tall spruce to another. Two were noted at Wrangell February 26, and Gray said the species was common on the opposite side of Wrangell Island, "where they feed along the beach, among the boulders at low tide, getting a species of snail, or shell fish." A small flock was seen on a muskeg flat on Kupreanof March 4, where they were feeding in a pine. A dozen birds were seen in a spruce in Hooniah Sound, near our camp May 19, and a male collected.

***Leucosticte tephrocotis littoralis*.** HEPBURN'S ROSY FINCH.—First noted at Juneau April 3, when a large flock fed about the Capitol grounds, in the dried grass free from snow. They were very tame, and would allow one within six feet before taking wing. I left for Wrangell April 10, and the birds were still about town at that time. Three birds were taken for identification. I next observed the species at the head of Muir Inlet, in Glacier Bay, where they were working back and forth across the moraines, or were entering crevices high up on the glaciated cliffs. I feel sure they were nesting, or preparing to nest, at this date, June 19. A male was collected. Perhaps a dozen were seen in one flock, and twice as many in another on the summit of Mt. Robert, September 9. These birds were hanging about the precipitous walls of rock, and were entering different crannies. I believe, from the favorable site, the birds must have nested there earlier in the season. Several small flocks were observed on the Granite Creek Mts. September 10, and a large flock on the Salmon Creek Mts. the next day. All were near the summit of the mountains, at an altitude of about 4000 feet and usually were about the precipitous inaccessible cliffs. I think one would have no difficulty in locating nesting sites on Mt. Robert in July; securing the nests and eggs would be a different matter.

***Spinus pinus*.** PINE SISKIN.—Fairly common during winter and spring, and at times they are the most numerous birds in a given locality.

Several small flocks were seen on Douglas Island January 9; they were abundant in flocks at Oliver Inlet, Admiralty Island February 3-9, where they were about as numerous as the Sitka Crossbill. Large flocks would be seen swirling over the trees, and their cheery little voices could be heard from all parts of the woods. A few were seen at Wrangell February 27, and on March 14, and they were observed in small numbers on Kupreanof March 4, and at Craig March 11-12. They were the most common passerine species at Wrangell April 11-18, and a few were seen in Hooniah Sound daily, May 7-24. A flock of a dozen was flushed from the alders in Glacier Bay October 13, and another flock was seen in Kootz-nahoo Inlet, October 27. Very few were noted during the winter, a small flock at Wrangell December 30, and two birds at Juneau March 2, 1921. They are erratic little creatures and may be very common at one time, and then none will be seen for a long period.

Plectrophenax nivalis nivalis. SNOW BUNTING.—Several birds were flushed from the bar at the mouth of Gold Creek, and others were seen about stables in the same locality, near Juneau on April 2. They resembled shore birds as they skimmed over the boulder strewn flat, and were very inconspicuous in such an environment. I saw them up to April 10, at which time I left town. On cold, windy days they were very wild, but on still, snowy days, they allowed a near approach, so I had no difficulty in securing a good series. The species was next seen at Muir Glacier June 19. They were scattered here and there over the glacial moraines near the great ice-sheet, and at no time were more than two or three seen together. I collected a female which was evidently a breeding bird. From the numbers scattered over the expanse of glaciated flats, it appears certain the birds breed in that locality. As we had gone into the Inlet on the flooding tide, it was necessary for us to go out on the ebbing, to keep from getting caught in the ice, and consequently, I had no time to look for nests. On my return to the Glacier August 12, a few more birds were seen, but not as many as in June. A flock of one hundred or more was flushed on the outer Beardslee Island, Glacier Bay, October 11. They swirled about over head for a few moments and then sailed up the beach, and I had no opportunity to note them again.

Calcarius lapponicus alascensis. ALASKA LONGSPUR.—The only spring records for the species were made on the Stikine Flats April 18-22, when a few birds were seen daily; their pleasing little whistle could be heard at almost any time. Occasionally a flock of them would come straggling by, some flying high and others low, without any apparent leadership. They were only observed on the mountain tops during the fall, when the "mountain-top migration" was at its height. A few birds were seen on the summit of the Granite Creek Mountains September 14, and two males were collected. Several flocks were seen on Mt. Robert September 23, and a band of a dozen individuals was noted on the outer Beardslee Island, in Glacier Bay, October 11; these were very tame and I had an excellent opportunity to watch them with the glasses as they fed among the dried vegetation.

Passerculus sandwichensis savanna. SAVANNAH SPARROW.—The first were seen in Hooniah Sound May 8, when several were feeding in dried beach grass, and working among the leafless alders. By May 10 they were very abundant, and remained so up to the time of our departure May 24. They were seen daily in Glacier Bay, along the beach, from June 12-20; one was seen on the moraine near Muir Glacier, the only passerine bird, with the exception of the Snow Bunting and *Leucosticte*, observed in that sterile region. Several more were seen on the moraine in front of Norris and Taku Glaciers, in Taku Inlet, June 26-28.

A few were observed during the fall months in the basins and on the mountain tops. I collected a specimen at Salmon Creek September 8, another up Granite Creek the 14th, and the last above timber line on Mt. Robert, September 23. Willett found this form, and the Aleutian Savannah Sparrow fairly numerous near Craig.

Zonotrichia leucophrys gambeli. INTERMEDIATE SPARROW.—None were observed during the spring months. I collected two on the Government trail near Salmon Creek, at sea level, September 8, and found them common above timberline on Mt. Robert (1800 feet) the next day, and collected two more specimens. Several were noted in the alders near the summit of the mountains of Granite Creek September 10, and a few were observed throughout the rest of the month, although they were not numerous. The last was recorded at Juneau, October 1. No Golden-crowned Sparrows were seen in company with this form.

Zonotrichia coronata. GOLDEN-CROWNED SPARROW.—These birds were rarely noted, and then only during the spring and summer months. One, a male was collected in Hooniah Sound, near our camp at the entrance to Patterson's Bay. It was the only one seen. They were abundant on Willoughby Island, in Glacier Bay, June 13, where they were hopping about among the alders and small spruce, and several were seen on the moraine in front of Norris Glacier, Taku Inlet, June 27-28. One bird acted as though it might be nesting in the vicinity, but I was unable to locate a nest.

Junco hyemalis hyemalis. SLATE-COLORED JUNCO.—This species proved rare, having been noted on but two occasions. Four birds were seen May 29, near Juneau, and on September 11, a small flock of about a dozen was flushed from along the tram running into Salmon Creek Basin. These birds alighted, and I had an excellent opportunity to watch them, I collected a male, but was forced to discard it. At times during the fall I saw small flocks which I took to be *hyemalis*, but I was unable to identify them positively.

Junco hyemalis oregonus. OREGON JUNCO.—This is a common bird and is to be seen the year round, but in comparatively small numbers among the northern islands. A scattering band or two wintered about Juneau, and were seen daily as they fed in the dried grass along the Government trail, where the wind had cleared the snow. From Wrangell southward, the species is more common; they were abundant at this little

village November 27, 1919, and a small series was taken. A few were noted during January near Juneau, and two collected. My notes read "Wrangell February 27, Kupreanof March 4, Craig the 12th,—few noted." A few were seen in Hooniah Sound throughout our stay May 7–24, but not daily. By May 31, however, the Juncos were common about Juneau and a female was seen building her nest, which was completed June 2, and the four eggs had been laid by June 8. Referring to my notes of May 31,—“Saw a female Junco carrying nesting material and watched her for some time. She made several trips, always to one spot which seemed to possess material to her liking. The male did not appear for some time, and then came hopping nonchalantly along. On the appearance of the little female, he promptly pursued her, she protesting vigorously. I noticed, however, that she was very careful not to drop a wisp of the nest lining.” The nest was on the ground in a thick clump of hemlocks, tucked back under a carpet of moss.

Another pair built outside our window and we could watch them at work. They completed the nest, and then abandoned it, building another in the moss a few feet away. I was out of town so much I was unable to keep accurate data, but they had five eggs, and the young were nearly ready to leave the nest July 4. Another nest was in the yard of a friend of mine, and as he was proudly taking me to it, the mother bird flushed off, directly into the mouth of a cat which had been following at our heels. The cat grabbed the bird and started across the street, running into a dog which gave chase,—and the Junco was turned loose in the cat's scramble to escape the dog. I was interested to see that the Junco returned to her nest, and was successful in raising her brood of five. This species is probably the commonest nesting bird in the vicinity of Juneau, at least they are less secretive in their methods than others.

They were common in Excursion Inlet June 12, where they were feeding along the boulder-strewn shore,—like so many Flycatchers, for they were jumping in the air to take insects on the wing. A few were seen on Forrester July 9–20 and Willett said there were four or five pairs nesting. Other records for the year would be superfluous, as one meets the species daily, but never in large numbers.

Melospiza melodia morphna. RUSTY SONG SPARROW.—

Melospiza melodia rufina. SOOTY SONG SPARROW.—Song Sparrows are resident the year around, and my notes show records for each month. They are more or less secretive in their habits, except during the breeding season, at which time the males sit on stumps and sing to their heart's content. In the winter, they are usually confined to the beach, where the tides have cleared the snow, although I have seen them in the woods a short distance. I first noted Song Sparrows in Taku Harbor November 15–16, and collected two; a few were seen on Kuiu and Kupreanof Islands November 18–24, and others were seen along the beach, near Juneau, in January. Three birds were taken during the month; four were collected at Oliver Inlet, Admiralty Island, February 3–9, and a few were seen at

Wrangell February 28–March 2, Kupreanof Island March 4 and Craig March 10. Two were collected at Juneau May 4. They appeared scarce in Hooniah Sound, where possibly six birds were seen between May 7–24; the two specimens taken seemed very large and dark. The males were in full song at Juneau June 9; three birds were seen at Point Couverton June 11, and they proved abundant on the outer Beardslee Island, Glacier Bay, June 12–20. They were still common on my return August 14, and a few were noted there October 11. Many birds were seen from time to time which I could not identify positively, as in the field they look much like the next form.

In Mr. Swarth's paper on the distribution of Song Sparrows in the northwest (Condor, November 1923, p. 216), based upon field work and the study of a great series of skins, he concludes that the Sparrows of the western islands (Chichagof, Baranof, Kuiu, Prince of Wales, Dall, Duke and adjacent small islands) may be called *rufina*, while *morphna* "will apply to the song sparrows of the eastern islands of the Alexander Archipelago, (Admiralty, Wrangell, Revillagigedo, etc.) and the adjacent mainland coast from Glacier Bay southward." The reader is referred to his excellent paper for a full discussion of the "*rufina* group."

***Melospiza melodia caurina*.** YAKUTAT SONG SPARROW.—These birds winter in the vicinity of Juneau in company with *morphna*, both along the mainland shore and on Douglas Island. I took one on January 9, and a few could have been noted daily; another was collected on Admiralty Island, Oliver Inlet, February 4. A few were seen at Craig March 12, and Willett took an excellent series during the winter months; he reported a few about Wrangell during December, and I saw five birds along the beach January 1–4–5, 1921 one of which was collected. Two were seen in Hobart Bay and five in Portage Bay January 16–17, and two collected, and another was observed on Sukoi Island the latter date. A male was taken at Juneau January 22, 1921. From the above, it will be seen these birds winter regularly throughout the islands.

***Melospiza lincolni striata*.** FORBUSH'S SPARROW.—The first of this species were observed at Salmon Creek, near Juneau May 29. Several were seen, and three collected; one of the females had already laid part of her eggs, and another had the shell deposit nearly complete. They were noted daily June 3–6 at Mendenhall River. I was walking along the bank one evening when a Forbush's Sparrow darted into the grass at my feet, as though for protection, and I looked up in time to see a Sharp-shinned Hawk swoop away. I did not see this form after the above date, in spite of the fact that I kept careful watch in favorable localities.

***Passerella iliaca townsendi*.** TOWNSEND'S FOX SPARROW.—These birds are abundant in summer among the islands and along the mainland shore; they do not usually winter in the vicinity of Juneau, according to my observations, although they are present among the southern islands, where the climate is more mild. Willett observed them throughout the winter at Craig. The species was first seen in Hooniah

Sound May 7-24, when from one to ten were seen daily. They were especially fond of the little mountain streams, where they fed in the dense tangle of undergrowth. They had become common at Juneau by May 26, and June 12-20, they were seen along the wooded mainland shores of Glacier Bay and on the beach of the outer Beardslee Island. On Forrester Island, they were seen daily, and they breed abundantly from May 1 to late July, according to Willett. We found a nest on July 10 with four eggs apparently well incubated; another nest with four small young was seen July 19. They nest somewhat as do the Juncos, hiding their nest in the moss on some little slope, under a log, or along a boulder; their nests are neatly made, and usually well concealed, the parent bird taking pains to slip away without attracting attention. Fox Sparrows were abundant in Glacier Bay August 8-15. Migration was evidently at its height during September, for they were very numerous about Juneau during that month, and were continually seen along the trails, as they darted among the bushes on either side.

Passerella iliaca sinuosa. VALDEZ FOX SPARROW.—One specimen, No. 677 was taken at Juneau September 8, 1920. It was a male bird.

Hirundo erythrogastra palmeri. WESTERN BARN SWALLOW.—The first of this form were seen on May 25, and they were common by May 29. They nest commonly about Juneau, where they pick favorable cornices for their nesting sites; several pairs were nesting on the porch of the "Governor's Mansion." Governor Riggs told me the birds were two weeks later in arriving during 1920, than in previous years. One nest nearly finished May 29, was built on a porch, on an electric meter. A few were seen daily in Glacier Bay June 12-20, and a male came aboard our launch while we were anchored in a pocket on the north end of Wiloughby Island. The rapidity with which the breeding birds start nesting operations is well represented by this species; they arrive in large numbers within a few days, build their nests, rear their young, and depart again for the south early in the fall.

Iridoprocne bicolor. TREE SWALLOW.—Five birds were seen over Gastineau Channel May 1. They were abundant in Hooniah Sound May 7-24, and were usually seen at the head of the little bays, where they worked back and forth across the fresh water ponds; they were especially numerous at the head of Patterson's Bay. I saw them commonly near Juneau on May 26, one pair making a nest in a hole in the balcony of our home. Another pair was observed entering a hole high up in a dead spruce. They were common in Glacier Bay June 12-20, in company with Barn Swallows. I have no records for the occurrence of this species in the fall, so it is probable they leave for the south early in the season.

Bombicilla garrula. BOHEMIAN WAXWING.—Several flocks of these birds were seen at Wrangell, November 27, 1919. They were tame and remained about the village for some time.

Lanius borealis invictus. ALASKA SHRIKE.—One was seen along the beach two miles below the village of Wrangell, January 5, 1921. Willett reported one at Wrangell October 12, 1920.

Vermivora celata lutescens. LUTESCENT WARBLER.—These little fellows were first seen at Hooniah Sound, near the head of Patterson's Bay, May 19; several were noted daily after that date, and their little "sewing-machine-like" notes were to be heard commonly in the woods. They proved abundant at Juneau May 25, and were especially numerous along the Mendenhall River June 3-6, where they seemed to find conditions to their liking among the willows. Two were seen in Berg Bay, Glacier Bay, June 15, and they were noted daily on Forrester Island July 9-21. A nest with three badly incubated eggs was found July 9. Willett said they nest from May 27 to July 10, according to his observations on Forrester.

Dendroica aestiva rubiginosa. ALASKA YELLOW WARBLER.—Several were seen in Sheep Creek Basin, near Thane May 30, and a male was collected. They proved abundant along Mendenhall River June 3-6, and a few were seen on Willoughby Island in Glacier Bay June 13. Often times, or rather, usually, one sees but a flash of yellow going through the tangle of alder, and as most of the Alaskan Warblers are similarly colored, positive identification is often impossible.

Dendroica coronata hooveri. ALASKA MYRTLE WARBLER.—One was seen near camp in Hooniah Sound May 15, first upon the beach, and then as it darted among the alders. They were abundant along the Mendenhall River June 3-6, where a few specimens were taken, and were also common at the head of Berg Bay, Glacier Bay, June 15, where they were feeding among the willows bordering the streams.

Dendroica townsendi. TOWNSEND'S WARBLER.—This species is evidently rather rare, at least I saw but one, and that near Patterson's Bay, Hooniah Sound, May 20. Willett reports it as not uncommon near Craig, where he took several specimens.

Wilsonia pusilla pileolata. PILEOLATED WARBLER.—These were the most abundant of the Warblers, and the first were seen near our camp in Hooniah Sound May 19. They were seen daily from that time, and proved to be abundant near Juneau May 25, and along the Mendenhall River June 3-6. They were also common on Willoughby Island, in Glacier Bay, June 13. Several specimens were taken in different localities, but no fall records were made.

Anthus rubescens. PIPIT.—Several flocks came into the gardens about Juneau May 1, and were still about town a week later. Several were seen at the head of Patterson's Bay May 7-24, where they hung about the fresh water ponds; a few were seen at Juneau May 26, and they were common in the grass of Sheep Creek Basin, near Thane May 30. They appear awkward as they stalk over the snow, but they are very inconspicuous in dried grass. I next noted them early in September above timber line on Mt. Robert, while others were observed on the Mendenhall Flat at sea level September 11; and again, the same date, they were observed on the Salmon Creek Mountains at an elevation of 4000 feet. They were usually tame, but if a strong wind happened to be blowing, they would flush wildly.

Cinclus mexicanus unicolor. DIPPER.—These fine little birds are resident throughout their range, and are to be noted along the turbulent mountain streams during summer, and near salt water, where the tides keep the streams open, in winter. The first were seen on the big flat at the mouth of Gold Creek, Juneau, January 11, and others were seen in the same general vicinity January 29–30, and April 5. A pair was seen along Granite Creek, Salmon Creek, and McGinnis Creek on every trip during the fall, and another pair was observed September 1, at Twin Points, Admiralty Island. A few specimens were taken. In the spring-time, the joyous voiced males can be heard a great distance, as their beautiful songs blend with the rhythmic note of rushing waters. I know of no more beautiful song than theirs.

I watched a bird diving in shallow water, on the Gold Creek bar, and it "flew" under the surface with pearl-like bubbles rushing off the extended wings. They are extremely capable divers,—and their presence brings an enchantment to otherwise uninteresting mountain torrents.

Nannus hiemalis pacificus. WESTERN WINTER WREN.—Generally distributed and resident throughout the region, although only a few are usually seen in a given locality. One bird was seen at Juneau January 11, another, a male, was taken at Oliver Inlet, Admiralty Island, February 6, and another at Craig March 12; two were seen at Wrangell April 13, and one on Sergief Island April 20. Only one was seen, on two occasions May 17 and 19, in Hooniah Sound. Two were noted June 8–9 near Juneau, and they were observed daily on Forrester Island July 9–21. Willett gave me the following data from Forrester: "two sets of eggs were noted May 21, and grown young were seen June 18." The nests of this species were plastered under the roots of over-turned trees, and old nests were numerous on Forrester.

Certhia familiaris occidentalis. TAWNY CREEPER.—These little fellows are not common. Several were seen throughout the year, the first, a male, being taken at Juneau April 7. One bird was seen on Forrester Island July 12, and Willett states he has seen others from time to time; one was noted on Admiralty Island, near Twin Points at 1200 feet elevation August 29, and another was observed practically at sea level on Point Retreat October 30. The only time I saw more than one bird was November 14, when at least half a dozen were working along, about 1000 feet up on Mt. Robert, in company with Western Golden-crowned Kinglets. The last was seen at Wrangell January 3, 1926. They are so small as to be easily overlooked in the dense woods, and unless one happens to catch the slight scratching noise made as they climb busily back and forth, they will not be seen.

Penthestes rufescens rufescens. CHESTNUT-BACKED CHICKADEE.—These cheery little creatures are often the only signs of bird life to be seen in the winter woods, and their quiet, comrade-like call, as they drift from one tree to another, can often be heard when the birds are obscured by the falling snow. They are tame, and inquisitive, and will often alight within

a few feet of one, especially if the observer "squeaks" at them. They are probably the most numerous of the winter birds, although but a few flocks will be seen on a days journey over the trails. They are to be noted the year around, throughout the whole of southeastern Alaska. Willett found a nest with newly hatched young on June 6, on Forrester Island.

***Regulus satrapa olivaceus*.** WESTERN GOLDEN-CROWNED KINGLET.—Seen most often during the winter months, when the leaves are off the deciduous trees; even then they are hard to see, especially when the snow lies deep upon the outstretched limbs of the spruce and hemlock. The Kinglets can be classed as fairly abundant throughout their range, but I believe they were most numerous on Admiralty Island, Oliver Inlet, February 3-6, when many were seen daily; they were also common at Craig March 12. Additional records are as follows:—a few were noted on Douglas Island January 9; small flocks near Juneau January 11-14, and 30; common at Wrangell February 25-March 2, Kupreanof March 4-5, and at Wrangell again April 11-18. A small flock was seen on Mt. Robert November 14, in company with a half dozen Creepers.

***Regulus calendula grinnelli*.** SITKA KINGLET.—These little creatures are as inconspicuous as the former species, and when they are working high in the evergreens, it is impossible (for me) to distinguish between the two forms. A few were seen daily at Wrangell April 11-18, and they were abundant on Chichagof Island, along the shores of Hooniah Sound in May. Their clear, cheery little mating note, somewhat like that of the Yellow-throat, was to be heard from early morn until late in the afternoon, and several small flocks worked about the strip of woods immediately about our camp. They were also common along the Mendenhall River June 3-6.

***Hylocichla ustulata ustulata*.** RUSSET-BACKED THRUSH.—These Thrushes are plentiful during the summer months, and were first noted in Sheep Creek Basin, near Thane May 30, when I collected a male, and observed a few others. Because of their rather secretive habits, they are hard to identify as they slink through the dense underbrush, so characteristic of the woods at sea level, but several were seen along the trails near Juneau, June 8. They were fairly plentiful on Forrester Island, being noted practically daily from July 9 to 21; a nest with four eggs was found July 14, about five feet from the ground, in salmon berry bushes. It was well concealed from all sides, and from above.

***Hylocichla guttata nana*.** DWARF HERMIT THRUSH.—This species became very common at Hooniah Sound May 8-24, where the birds fed among the alders along the beach; they were tame, and several fed close about our camp. They were also abundant along the Mendenhall River June 3-6, and on Point Couverson June 11. At this latter place, I found a nest stuck in a crevice of a cliff, close to the water's edge. There were four bluish eggs. I intended to return by the Point, and secure photographs of the nesting bird, but weather conditions made this impossible. The birds were seen commonly on Willoughby Island, in Glacier Bay, June 13, and

in Berg Bay two days later; a few were seen daily on Forrester, and Willett found a nest on June 15, which contained two small young, and an addled egg. This species was common about Juneau during the spring, summer and fall, up until September 15, after which date I have no records.

***Planesticus migratorius caurinus*.** NORTHWESTERN ROBIN.—Robins are very common throughout the summer, and were first noted at Wrangell April 13, when half a dozen were seen feeding in a garden; they were abundant by April 26. Mrs. Bailey recorded her first Robins at Juneau April 14, and they were common a week later. At Hooniah Sound, May 8–24, they were exceedingly plentiful, being the most common bird of the vicinity. They fed along the beaches exclusively, none being seen back in the woods, or on the muskegs; while droves worked the beaches like so many Sandpipers, in fact, we considered them as “shore-birds” for the time being. A few were seen on Willoughby Island, in Glacier Bay, June 13, and they were abundant about Juneau all summer. One family was raised in a spruce a few feet from our front window, and many young were seen about the lawns by the middle of August, they were common during September, and on the first of the month, I counted 41 young birds on our small front lawn, where they were grubbing for worms. Mr. Gray tells me that Robins have wintered, occasionally, at Wrangell.

***Ixoreus naevius naevius*.** VARIED THRUSH.—These Thrushes are abundant in the vicinity of Juneau during the summer, but most of them winter to the southward, among the islands,—especially at the southern end of Prince of Wales and Dall Islands. Four birds were seen on Kupreanof November 19, and they were fairly common about Wrangell November 26, 1919. One was seen at Juneau January 26. Not many winter as far north as Wrangell, however, only stragglers being seen during the milder months. They were noted at Wrangell April 13, when their clear bell-like notes could be heard from all parts of the woods. It is a most pleasing note, and is especially welcome in this country, where real bird music is seldom heard. They were abundant at Juneau by April 27 and at Hooniah Sound May 7–24. They were seen daily on Forrester Island from July 9–21, and Willett reported seeing young as early as May 21, and the finding of a nest June 1, with young. The nest was a delicately made structure of the finest moss, being placed in a dense copse of hemlock, about 15 feet from the ground. These birds are very shy during the nesting season, and resent intrusion. They were very common about Juneau all summer, and were exceedingly numerous during September, when the young had joined the adults; they were noted along all trails, and back in the deepest woods, sometimes feeding among the fallen leaves upon the ground, and again, they were seen perched high up in the tallest of the spruces.

***Sialia currucoides*.** MOUNTAIN BLUEBIRD.—A pair of this species was seen near the cemetery at Juneau May 4, and a brightly colored male was observed at Patterson's Bay, Hooniah Sound, May 19.

REFERENCES.

DIXON, JOSEPH.

Migration of the Yellow-billed Loon.—Auk, No. 4, 1916.

GRINNELL, J.

Birds and Mammals of the 1907 Alexander Expedition to Southeastern Alaska.—University of California Publications in Zoology, Vol. 5, No. 2.

HEATH, HAROLD.

Birds Observed on Forrester Island, Alaska.—Condor, No. 1, 1915.

HERSEY, F. S.

A List of Birds Observed in Alaska and Northeastern Siberia During the Summer of 1914.—Smithsonian Misc. Collections, Vol. 66, No. 2.

SWARTH, H. S.

Birds and Mammals of the 1909 Alexander Expedition.—University of California Publications in Zoology, Vol. 7, No. 2.

The Sitkan Race of the Dusky Grouse.—Condor, No. 2, 1921.

The Systematic Status of Some Northwestern Song Sparrows.—Condor No. 6, 1923.

WILLETT, George.

Birds of Sitka and Vicinity, Southeastern Alaska.—Condor, No. 2, 1914.

Summer Birds of Forrester Island, Alaska.—Auk, 1915, p. 295.

Further Notes on the Birds of Forrester Island, Alaska.—Condor No. 1, 1917.

Bird Notes from Forrester Island, Alaska.—Condor, No. 2, 1918.

Additional Notes on the Avifauna of Forrester Island, Alaska.—Condor No. 4, 1920.

Bird Notes from Southeastern Alaska.—Condor, No. 5, 1921.

Bird Records from Craig, Alaska.—Condor, No. 3, 1923.

Field Museum of Natural History,
Chicago, Ill.

PHOTOGRAPHING WAYNE'S CLAPPER RAIL.

BY DONALD JOHN NICHOLSON.

(Plates XX-XXI.)

Wayne's Clapper Rail is numbered among the common salt-marsh species and is found along the entire Atlantic coast of the State in great numbers. It is not generally known by sight but rather by its vociferous notes, uttered in loud, noisy manner throughout the day. One bird starts and then a chorus is taken up by a score of birds one after another until the marshes resound with harsh notes.

Occasionally one is seen darting across the road to reach a chosen feeding ground or is caught skulking in an open muddy spot in the vast scattered patches of marsh grass in the network of sloughs, and it is extremely rare to catch one leaving its nest or even about the nest, especially if the eggs are fresh.

The plumage harmonizes so well with the gray-colored mud and dead grass that the bird is indeed difficult to see although it may be well within view. The wings when spread are of a dull reddish-brown hue, the middle back is of bluish-gray cast, and the belly barred with black. This is the impression I got when I had the opportunity to be within three feet of a pair that was very solicitous about the welfare of pipped eggs, on June 13, 1926.

While at New Smyrna, which is in Volusia County, on May 28, I had the good fortune to find a nest of three eggs of this Rail, having been attracted by the uneasy calls of the birds, upon parking my car within twenty feet of the nest. They called so close to the nest that it was an easy matter to locate it, some ten feet from a road which was built across the marsh for three-quarters of mile. Not having a full set of the species I decided to return and collect them later. On June 13, I came back and found broken egg shells in the nest, the birds having destroyed the eggs. I say the Rails destroyed the eggs because I had several years before found a nest with three eggs in a well-concealed place that Crows could not possibly discover and the same thing happened.



Photos by D. J. Nicholson

WAYNE'S CLAPPER RAIL.

1. SETTLING ON THE EGGS.
2. RESENTING AN INTRUSION.





Photos by D. J. Nicholson

WAYNE'S CLAPPER RAIL.

1. NEST AND EGGS.
2. EGGS AND FRESHLY HATCHED YOUNG.



It would appear therefore that the Rails are extremely suspicious birds.

Disappointed at the outcome, because I had anticipated photographing the bird on the nest, if possible, I retraced my steps to a distance of about three hundred feet, when my eyes focused upon a suspicious-looking bird-like object reposing on top of a bunch of marsh grass. Looking closer I finally made out the outline of a sitting Rail in plain view of the road and within twenty-two feet of it. Here was my chance at last. Carefully I walked to within eighteen feet of the bird and snapped a picture with my Graflex but no nest of the bird can be seen in the picture. Conceiving the idea that a closer approach could be made, I crept quietly and steadily towards the subject until I had gotten within six feet of her. She watched me intently never moving a feather, but at this distance she could not bear the suspense any longer, and rising slowly slid backward off the nest on the opposite side. As the grass interfered with my focus I did not attempt a picture and thought I had lost a chance of a lifetime. Before she left I could hear a little one in the nest cheeping and others in the grass close by, so I knew the reason for her courage. The nest contained two pipped eggs and one shiny, black, downy young, perfectly dry, and the moment she left the little one scrambled down the opposite side of the nest from where I stood. If I could not get her picture the best I could do was to photograph the nest and eggs. As I bent over to part the grass I got the surprise of my life, the old bird ran up the approach and onto the nest and gave me a vicious jab on the hand. She left the nest three times and returned to have her photograph taken on each occasion. Three times I put the young bird in the nest to get a pose and each time he ran away, until finally tiring of his efforts he lay quiet long enough to be photographed.

While this was going on the male was within three feet of me just under the nest, and when I wanted other different poses both birds were very obliging. Their notes to the young were low clicking sounds apparently made by snapping the bill, and twice the female made loud outcries within several feet of me, with raised wings and ruffled feathers. Once she tried to lead me off by crying loudly and flying a short distance and upon alighting went through demonstrations.

It is wonderful the bravery and courage a wild timid bird will display when the young are in danger, and this is an example in an especially secretive species.

Upon my return several hours later after all my plates were used I found her sitting contentedly upon her two eggs, and taking another look to see what progress they had made, I found them unchanged. In the intervening time I found four more nests in similar situations and all within fifty feet of the road. These were empty, and apparently fresh.

I could discern no difference in the plumage of the male and female, but the young was covered with a beautiful fluffy, shiny, coal black down, with mandibles of a light color. There were no signs of egg shells about the nest.

Orlando, Florida.

NOTES ON FLORIDA BIRDS.

BY ARTHUR CLEVELAND BENT AND MANTON COPELAND.

THE following notes apply particularly, although not exclusively, to the birds of the west coast of Florida in the general vicinity of St. Petersburg. One or both of the writers resided in Pass-a-Grille at the southern extremity of Long Key, a low, sandy island, sparsely wooded, in Pinellas Co., from November 10 to April 30, 1924-1925, and visited many of the neighboring islands in Boca Ciega Bay as well as numerous localities on the mainland from the northern to the southern limits of the Pinellas Peninsula. The region is one of varied topography and admirably suited to many species of land and water birds. The shores of the lakes and ponds are in some instances thickly wooded, in others swampy; the open, flat pine woods are especially in evidence; citrus groves cover many square miles; bayous bordered by mud flats or marshes abound, and to the west appear the beautiful sand beaches of the Gulf of Mexico.

Longer trips were occasionally made into central and eastern sections of the State, where certain species were found which were not seen on the west coast, and they have been added to the list. The more important places visited outside of Pinellas Co., are as follows:

February 22.—Hillsborough River, Hillsborough Co.: A heavily timbered river forest of live oaks, pin oaks, hickories, locusts, palmettos, pines and cedars with an undergrowth of hawthorn, ironwood and dogwood.

March 5.—Prairies east of Punta Gorda, Charlotte Co.: Open prairie land dotted with marshy ponds and a few trees, principally palmettos.

March 7-8.—Northern part of Polk Co.: Extensive areas of flat pine woods and cypress swamps.

March 19-23.—Kissimmee River prairies near Bassenger, Highlands and Okeechobee Cos.: Similar to the prairies near Punta Gorda with marshes and numerous live oak and palmetto hammocks bordering the river.

March 28-29.—Merritt's Island, Brevard Co.: Open prairies, marshes and meadows.

March 30.—Wekiva River, Orange Co.: A spring fed river flowing through heavy forests and swamps.

April 18-19.—Weekiwachee River, Hernando Co.: Similar to the Wekiva River region.

April 26.—Lake Apopka, Lake Co.: An arm of the lake surrounded by marshes.

We are indebted to Messrs. William G. Fargo of Jackson, Mich., Charles J. Pennock of Kennett Square, Pa., Clarence F. Stone of Branchport, N. Y., and Oscar E. Baynard of Plant City, Fla. for assistance in the field and for data on the occurrence of many species of birds. Mr. Fargo, who resided at Pass-a-Grille the greater part of the time from January 26 to March 12, 1924 and from January 12 to April, 1925, gave us the use of his notes which have added greatly to the value of our list.

Certain dates given us by Mr. Fargo refer to the early part of 1924 and are so noted; all others apply to November to April, 1924-1925.

Subspecies, of which specimens were not collected, are recorded on the grounds of geographical probability.

Undoubtedly many more species occur in the middle section of Florida than appear on our list, but we hope it may serve as a basis for further observations in a region of great interest to the ornithologist and one which, in certain portions at least, will undergo considerable change in the next few years as a result of invasion by real estate promoters, who make little of transforming ponds into parks and beaches into bayous.

1. *Colymbus auritus*. HORNE GREBE.—An uncommon winter resident. It was seen on Tampa Bay in December and on Boca Ciega Bay, March 17.

2. *Podilymbus podiceps*. PIED-BILLED GREBE.—A rare resident, more common in winter. A few pairs remain to breed on inland ponds. It was seen in Charlotte Co., March 6; Polk Co., March 19; St. Petersburg, April 6; Lake Co., April 26.

3. *Gavia immer*. LOON.—One was seen off Ozone, February 27, and a few solitary birds spent the winter on Tampa and Boca Ciega Bays. They were recorded from December 3 to March 17.

4. *Larus argentatus*. HERRING GULL.—A common winter resident. Many immature birds of the first and second year and a few adults were

seen from the time of our arrival until our departure. They frequented the docks, beaches and islands about Pass-a-Grille, where they were very tame.

5. *Larus delawarensis*. RING-BILLED GULL.—A common winter resident associated in time and place with the Herring Gulls.

6. *Larus atricilla*. LAUGHING GULL.—An abundant resident about Pass-a-Grille and seen wherever we went along the coast. They are said to breed on the islands outside of Tampa Bay. We found them associated with the larger Gulls about the wharves, where they were easily approached and also with the Royal Terns on the sand bars. Adults began to assume black heads in February and the full nuptial plumage was completed by the last of March, when many showed pink breasts. Young birds were still largely in first winter plumage, except for more gray in the mantle, when we left Pass-a-Grille.

7. *Larus philadelphia*. BONAPARTE'S GULL.—This Gull proved to be rare on the west coast, but commoner on the east coast. It was noted by us near Long Key, March 13, and in Pinellas Co. by Mr. Fargo, who records January 23 as the date when it was first seen. It was common at Titusville March 29.

8. *Sterna caspia imperator*. COUES' CASPIAN TERN.—A rare species, only one or two having been seen occasionally with the Royal Terns. One was shot near Pass-a-Grille by Mr. Fargo, and it was seen at Gulfport, December 23, and at Seminole Bridge, December 26.

9. *Sterna maxima*. ROYAL TERN.—An abundant resident. Large flocks were seen on the sand bars near Pass-a-Grille all winter, and it is said to breed on islands farther south, outside of Tampa Bay. Only a few adults assumed wholly black crowns in March and April.

10. *Sterna sandvicensis acufflvida*. CABOT'S TERN.—A few were seen with the Royal Terns on December 5 and February 7, and one was shot on February 7 near Pass-a-Grille. It was not recorded in the spring.

11. *Sterna forsteri*. FORSTER'S TERN.—An uncommon winter resident. Two or three immature birds frequented the vicinity of the bridge to Long Key in March and April, where they were positively identified, although none were taken. Mr. Fargo recorded this Tern in Pinellas Co. on February 17 and collected one on February 15 the preceding year.

12. *Sterna hirundo*. COMMON TERN.—A few adult and young birds were seen about Pass-a-Grille from November 11 to February 7, but none were noted during the spring. Mr. Fargo reports seeing them here on March 4, 1924.

13. *Sterna antillarum*. LEAST TERN.—A common summer resident, first seen near Long Key on April 12. It is said to breed in large numbers on islands along the coast.

14. *Rynchops nigra*. BLACK SKIMMER.—A common resident, seen at Long Key in November and December, and near Clearwater on April 7. It is said to breed on the islands along the coast.

15. *Anhinga anhinga*. WATER-TURKEY.—A common resident locally on lakes, ponds and rivers in Pinellas, Hillsborough, Polk, Charlotte, Lake, and Okeechobee Counties. It was found nesting at Holmes Pond near Clearwater, April 7, with large young; and on a pond in Polk Co., March 29, with eggs and young. Its nests are built in trees and bushes on boggy islands in large marshy ponds.

16. *Phalacrocorax auritus floridanus*. FLORIDA CORMORANT.—An abundant resident, great numbers frequenting the passes, bays and islands along the coast during the fall and winter, and roosting at night in dense flocks on the sandy keys. They withdrew to their breeding grounds during February and March. Breeding colonies were found on two small mangrove keys near Ozona, Pinellas Co. in April, and large numbers bred on Bird Key in Boca Ciega Bay. Nest building began about the first of March and eggs were found, April 9. The nests, made wholly of mangrove twigs bearing leaves, were placed in the tops of the tallest black mangroves, 20-30 feet from the ground.

17. *Pelecanus erythrorhynchos*. WHITE PELICAN.—Three or four birds were seen about Boca Ciega Bay, November 18 and 21, and a flock of thirty or forty on the Gulf, off Pass-a-Grille beach, December 1. Mr. Fargo records seeing them in Pinellas Co., January 28, 1924 and January 22, 1925.

18. *Pelecanus occidentalis*. BROWN PELICAN.—An abundant resident and one of the most interesting and characteristic birds of the Tampa Bay region. About the wharves they may stand within arm's reach of the fishermen and sometimes have to be pushed out of the way. Again they may swim close to the boats in which men are fishing, or even alight on the boats, where they wait for fish to be thrown to them which they are experts in catching. Occasionally a bird swallows the fisherman's bait and is caught. Elsewhere, however, they are more wary. On the sandy islands, for example, where they roost in large numbers with the Cormorants, they cannot be approached. On Bird Key they began nest building about the middle of April and the eggs were laid during the latter part of that month. The nests were built on the flat tops of the low black mangroves around the shores of a bayou and on an island in it. They were made wholly of mangrove twigs with the leaves on them. Three plumages were recognizable at all seasons. The first year birds retain the dull brown upper parts and white bellies throughout the year. The second year birds in the fall are like the winter adults, except for considerable dusky marking on the head and neck which disappears during the winter so that by spring the younger individuals are indistinguishable from the winter adults. Adults in the fall have white necks and yellow heads, the brown hind neck of the nuptial plumage being acquired during January and February.

19. *Fregata aquila*. MAN-O'-WAR-BIRD.—A fairly common bird during the fall and spring, but rare during the winter. Twenty-two were seen over Pass-a-Grille beach on November 15, and it was recorded at Maximo Point, December 23. Large numbers frequented the Pelican colo-

nies on Bird Key after April 9: at least a hundred were seen there April 21. Mr. Fargo recorded one in Pinellas Co., March 17.

20. *Mergus serrator*. RED-BREASTED MERGANSER.—Immature birds and females were common on all the bays throughout our stay and were very tame. A few adult males, seen on February 7, disappeared soon after that date.

21. *Anas boschas*. MALLARD.—A pair was seen in Charlotte Co., March 5, by Mr. Walter B. Savary.

22. *Anas fulvigula fulvigula*. FLORIDA DUCK.—One or two pairs were seen in Charlotte Co., March 5 and 6, and in Okeechobee Co., March 20-22. Two nests containing eggs were found on Merritt's Island March 29. They were well hidden in tall thick clumps of bulrushes (*Scirpus*).

23. *Querquedula discors*. BLUE-WINGED TEAL.—A single adult male was seen in a prairie pond near Bassenger, March 20, and another male in a similar location in Charlotte Co., March 5.

24. *Dafila acuta tzitzihua*. PINTAIL.—This species was reported as seen by Mr. Fargo on February 28.

25. *Aix sponsa*. WOOD DUCK.—A common resident on inland streams and lakes with heavily wooded borders. It was seen in Polk Co., March 8, at Wekiva River, March 30, and near Bassenger, March 21. In the last locality a pair was apparently preparing to nest in a hollow oak near an orchard.

26. *Nyroca marila affinis*. LESSER SCAUP DUCK.—An abundant winter resident all through our stay in all the bays and in many of the lakes.

27. *Erismatura jamaicensis*. RUDDY DUCK.—Two or three were seen in a pond on Merritt's Island, March 29, associated with Lesser Scaups.

28. *Ajaia ajaja*. ROSEATE SPOONBILL.—Two were seen on Bird Key, April 9 and again April 14. It is said to be rather common about Boca Ciega Bay in spring and summer.

29. *Guara alba*. WHITE IBIS.—A common resident. Thousands nested on Bird Key, beginning late in March or early in April, in a dense colony in the low mangroves in the interior of the island. The nests were made of twigs and leaves of the mangroves and placed from six to ten feet above the mud or water. The first young were noted, April 21. A small colony of sixty or seventy-five pairs nested on a boggy island, covered with a heavy growth of elders in Holmes Pond. They were associated with Little Blue, Louisiana, Ward's and Black-crowned Night Herons.

30. *Mycteria americana*. WOOD IBIS.—A few birds were seen feeding on the mud flats of Boca Ciega Bay, November 18 and 21, and December 3. Mr. Fargo noted one in Pinellas Co., February 14. A large breeding colony was found in a cypress pond in the wildest part of northern Polk Co., March 8. The nests were in large cypress trees forty to sixty feet above the water, and there were from four to twelve in a tree. They were small and poorly made of sticks, and lined with finer twigs and fresh, budding leaf-stems of cypress. They contained fresh eggs.

31. *Botaurus lentiginosus*. BITTERN.—An uncommon winter resident and a rare breeder. It was noted in Charlotte Co., March 5; Okeechobee Co., March 20; on Merritt's Island, March 29 and in Clearwater, April 7.

32. *Ixobrychus exilis*. LEAST BITTERN.—A common summer resident. Two nests containing eggs were found in the tall rank growth of wild parsnip, flags and pickerel-weed on boggy islands in Lake Apopka, April 26.

33. *Ixobrychus neoxenus*. CORY'S LEAST BITTERN.—A rare summer resident. One was seen in the saw grass of Holmes Pond, April 7, where Mr. Oscar E. Baynard reports having found its nest. He states that the downy young are always as black as young Clapper Rails and that both adults are always dark colored, evidence supporting the view that Cory's Least Bittern is a distinct species and not a color phase of *I. exilis*.

34. *Ardea herodias wardi*. WARD'S HERON.—A common resident. At least a few pairs were found nesting in all the colonies of Cormorants and Herons examined, and there were some isolated small colonies. They breed very early, young birds being noted as early as February 27. Their nests usually occupied the tops of the tallest trees in the rookeries.

35. *Casmerodius egretta*. EGRET.—A common resident. They were often seen feeding on the mud flats about Boca Ciega Bay, forty-one being noted on one flat, November 18. Breeding birds were found in large numbers on Bird Key where they had eggs on March 11 and young on April 9. The nests were placed ten to twenty feet from the ground in the thick growths of mangroves, buttonwoods and willows in close association with the Florida Cormorants.

36. *Egretta candidissima candidissima*. SNOWY EGRET.—An uncommon resident. A few frequented a bayou near Gulfport during the fall, two or three were seen whenever we visited the vicinity of Seminole Bridge and a few pairs bred in the White Ibis colony on Bird Key.

37. *Dichromanassa rufescens*. REDDISH EGRET.—This species is rare or casual. One was seen, November 20, and several, a few days later, near the north end of Long Key. Mr. Fargo records one in Pinellas Co., March 17.

38. *Hydranassa tricolor ruficollis*. LOUISIANA HERON.—An abundant resident. It was frequently seen on all the bayous and flats during the winter. We found it nesting at Holmes Pond, April 7, and many bred on Bird Key, where eggs were seen, April 9, and small young, April 21. The nests were placed in the lower growth of mangroves.

39. *Florida caerulea*. LITTLE BLUE HERON.—An abundant resident. It was noted regularly all winter in the bayous and on the flats of Boca Ciega Bay. A thriving colony, nested in the Holmes Pond rookery with the White Ibises, Louisiana and Black-crowned Night Herons. They had eggs there on April 7 and young in some of the nests on April 22. A few were seen on Bird Key in April, where they may have been breeding. The young birds in white plumage were beginning to change during the last week of March.

40. *Butorides virescens virescens*. GREEN HERON.—A common resident on inland ponds and streams. It was seen in Charlotte Co., March 5; at Wekiva River, March 30; Holmes Pond, April 7; Pasadena, April 13, and on Bird Key, April 14.

41. *Nycticorax nycticorax naevius*. BLACK-CROWNED NIGHT HERON.—A common resident. A small breeding colony was found in a willow pond near Punta Gorda, March 5, and a larger one in the Holmes Pond rookery mentioned above. In the latter locality there were young of various ages on April 7. It was also recorded at Gulfport, February 14.

42. *Nyctanassa violacea*. YELLOW-CROWNED NIGHT HERON.—A resident less common than the preceding species. A small breeding colony was found on Bird Key, restricted to a limited area of large black mangroves, where the nests were placed at medium heights below the tree tops. Eggs were seen there on April 9. This species was also found preparing to nest in Charlotte Co., March 5, and on the Wekiva River, March 30.

43. *Grus mexicana*. SANDHILL CRANE.—A common resident on the prairies and flatwood ponds. About thirty were seen between Punta Gorda and Fisheating Creek, Charlotte Co., on March 5. Three nests containing eggs were found in prairie ponds near Bassenger, March 21. One set of eggs was on the point of hatching.

44. *Aramus vociferus*. LIMP KIN.—A rare resident which is becoming rarer. It is restricted to only a few localities on inland rivers. One bird was seen on the Wekiva River, March 30, and two or three on the Wekiwachee River, April 19. Several old nests were seen in the rank vegetation along the banks of the rivers, but no occupied ones were found.

45. *Rallus elegans*. KING RAIL.—A common resident in fresh-water marshes, but more often heard than seen. A nest containing nine fresh eggs was found near Plant City on March 30, in a marsh overgrown with pickerel-weed and "ty-ty" bushes in the midst of a breeding colony of Boat-tailed Grackles.

46. *Rallus crepitans scotti*. FLORIDA CLAPPER RAIL.—An abundant resident in the salt-water marshes along the west coast and bays. Some old nests were found in the bulrushes (*Scirpus*), but no occupied ones.

47. *Porzana carolina*. SORA.—It was seen by Mr. Fargo in Pinellas Co., March 26.

48. *Ionornis martinicus*. PURPLE GALLINULE.—Uncommon and local in summer, rare in winter. It is restricted to deep, fresh-water ponds overgrown with "bonnets" (*Nymphaea*), pond lilies and pickerel-weed (*Pontederia*), where it nests in the rank vegetation of floating or boggy islands. Three nests were found, with six nearly fresh eggs in each, one in a pond near Zephyrhills, April 25, and two on the following day in an arm of Lake Apopka. It was noted at Clearwater, December 27.

49. *Gallinula chloropus cachinnans*. FLORIDA GALLINULE.—A common resident found in places similar to the preceding. It nests mainly in the pickerel-weed around the borders of ponds; one nest containing four eggs was found, April 25.

50. *Fulica americana*. COOT.—A common winter resident on fresh-water lakes and ponds. A pair seen in the Gallinule pond at Zephyrhills, April 25, and a pair at Lake Apopka, seen on the following day, were probably breeding birds. About one hundred and fifty were recorded on the Kissimmee River, March 20–22.

51. *Gallinago delicata*. WILSON'S SNIPE.—An uncommon winter resident in fresh-water marshes. It was seen near St. Petersburg, December 12; in Hillsborough Co., February 22; Charlotte Co., March 5; Polk Co., March 8; Okeechobee Co., March 20; and at Merritt's Island, March 29.

52. *Limnodromus griseus* (subsp.?). DOWITCHER.—An uncommon winter resident. It was seen on the mud flats about Boca Ciega Bay, associated with the smaller Sandpipers, on December 23 and February 7, and at Gulfport, March 26 and April 13.

53. *Calidris canutus*. KNOT.—This species was common, more or less, all winter on the sandy islands and beaches about Pass-a-Grille, but more common in the spring and fall. It usually appeared in small, isolated flocks. Specimens collected on April 2 showed the beginning of the body molt, which was nearly completed in birds taken on April 16.

54. *Pisobia maculata*. PECTORAL SANDPIPER.—A rare species, only three birds being seen during our stay. They were on a sandy island near Pass-a-Grille, March 14.

55. *Pisobia minutilla*.—LEAST SANDPIPER.—It was seen in abundance in large flocks all winter on the sandy islands and mud flats about Boca Ciega Bay, associated with all the other small Sandpipers and Plovers.

56. *Pelidna alpina sakhalina*. RED-BACKED SANDPIPER.—It was common all winter, but apparently more so in the spring, associated with the Least Sandpipers. Adults molting into spring plumage, with black bellies, were noted, April 16.

57. *Ereunetes pusillus*. SEMIPALMATED SANDPIPER.—A common bird seen all winter and associated with the Least, Red-backed and Western Sandpipers.

58. *Ereunetes mauri*. WESTERN SANDPIPER.—The relative abundance of this and the preceding species is in doubt. Mr. Fargo has an adult Western Sandpiper which he collected near Pass-a-Grille, March 4, and it is likely that the large flocks of small Sandpipers which we saw contained many individuals of *E. mauri*.

59. *Crocethia alba*. SANDERLING.—An abundant winter resident on Pass-a-Grille beach and on the sandy islands below it. No change of plumage, except wear and fading, was noted up to April 16. Probably all the wintering birds were young.

60. *Limosa fedoa*. MARBLED GODWIT.—A rare visitant. Mr. Fargo saw one near Pass-a-Grille, March 2.

61. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—A few were seen about the prairie ponds near Bassenger, March 20.

62. *Totanus flavipes*. LESSER YELLOW-LEGS.—An uncommon winter resident. It was seen at Pass-a-Grille, November 18; Gulfport, December

23; Clearwater, February 27; Merritt's Is., March 29; and Pasadena April 13.

63. *Catoptrophorus semipalmatus semipalmatus*. WILLET.—An abundant resident on the beaches, bayous and marshes along the coast. It is said to breed on the grassy islands. A large flock frequented a muddy bayou near Gulfport all winter. A bird taken on April 2 had practically completed its molt.

64. *Actitis macularia*. SPOTTED SANDPIPER.—A rare winter resident. One was noted on Cabbage Key near Pass-a-Grille, February 23, and Mr. Fargo records it in Pinellas Co., February 14, 1924, and February 7, 1925.

65. *Squatarola squatarola cynosurae*. BLACK-BELLIED PLOVER.—A common winter resident. Immature birds were present all winter on Pass-a-Grille beach and on the sandy islands south of it. They were tame in the former locality, but very shy in the latter. Adults shot on February 17 had nearly completed the molt of the remiges and were acquiring some black on the breasts, but young birds taken April 7, were still in immature plumage. The first black-bellied birds were noted on April 16 at Pass-a-Grille.

66. *Oxyechus vociferus*. KILLDEER.—A fairly common bird recorded all winter. It was seen at Pass-a-Grille, November 18 and February 22 Gulfport, December 23; Hillsborough Co., February 22; Charlotte Co., March 5; Plant City, March 7; and Polk Co. March 8.

67. *Charadrius semipalmatus*. SEMIPALMATED PLOVER.—Both adults and young were abundant all winter on the beaches, islands and mud flats about Boca Ciega Bay.

68. *Charadrius melodus*. PIPING PLOVER.—A common winter resident, both adults and young birds, on the beaches and sandy islands near Pass-a-Grille.

69. *Charadrius nivosus*. SNOWY PLOVER.—An immature specimen was collected by Mr. Fargo near Pass-a-Grille, February 7, 1924. Since we failed to identify this species in the field, we have no information in regard to its abundance.

70. *Pagolla wilsonia wilsonia*. WILSON'S PLOVER.—A common resident on the sandy islands south of Pass-a-Grille, where it undoubtedly breeds. Courtship behavior was noted, March 14.

71. *Arenaria interpres morinella*. RUDDY TURNSTONE.—It was found in small numbers all winter on the beaches near Pass-a-Grille. Adults in nearly full spring plumage were noted on April 2.

72. *Haematopus palliatus*. OYSTER-CATCHER.—One was seen on November 18, and again on February 7, near Pass-a-Grille.

73. *Colinus virginianus floridanus*. FLORIDA BOB-WHITE.—A common resident, seen almost everywhere on the mainland, especially in the flat pine woods and saw palmetto patches. It was noted in flocks in November and December and in pairs in April. A nest containing twelve eggs was found near Orlando, April 25.

74. *Meleagris gallopavo osceola*. FLORIDA TURKEY.—Turkeys were said to be still living in all the heavily forested regions visited. The only signs of them seen, however, were numerous tracks in the mud which were pointed out by an old hunter in Charlotte Co.

75. *Zenaidura macroura carolinensis*. MOURNING DOVE.—A common resident in the open country on the mainland.

76. *Chamaepelia passerina passerina*. GROUND DOVE.—A very common resident seen almost everywhere, but especially near houses in the small towns and villages, where it is a sociable and familiar bird.

77. *Cathartes aura septentrionalis*. TURKEY VULTURE.—An abundant resident everywhere, and more evenly distributed than the next species.

78. *Coragyps urubu*. BLACK VULTURE.—A common resident, but more locally distributed than the preceding species. A great many Black Vultures, and a few Turkey Vultures, constantly frequented Bird Key, where they probably lived on eggs and young birds.

79. *Circus hudsonius*. MARSH HAWK.—A fairly common winter resident and said to breed occasionally. It was seen in a number of localities near the coast and inland from November 11 to April 13.

80. *Accipiter velox*. SHARP-SHINNED HAWK.—One was seen on Long Key, November 20, the only one recorded during our stay. It is said to nest in the hardwood timber of Hernando Co.

81. *Accipiter cooperi*. COOPER'S HAWK.—An uncommon resident. It was seen in Gulfport, February 14, and in Hillsborough Co., February 22.

82. *Buteo borealis borealis*. RED-TAILED HAWK.—A fairly common resident. A nest, with one small young and a hatching egg, was found forty feet from the ground in a large, solitary cypress on the outer edge of a small cypress grove near Bassenger, March 21. This species was seen in Clearwater, December 27; Charlotte Co., March 5; and in Highlands Co., March 19.

83. *Buteo lineatus alleni*. FLORIDA RED-SHOULDERED HAWK.—The commonest resident Hawk. The following nests were found: Hillsborough Co., February 22, fifty-five feet up in a pin oak in a heavily timbered river forest; Polk Co., March 8, sixty feet up in tall cypress in cypress swamp; in hammocks along the Kissimmee River, March 22, two nests fifty and forty feet up in large live oaks.

84. *Buteo platypterus*. BROAD-WINGED HAWK.—One was seen at short range and positively identified near Gulfport December 23, and Mr. Fargo saw one in Pinellas Co., January 22.

85. *Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.—A common resident. About eighteen occupied nests were found in the general vicinity of Tampa Bay and its branches. They were in the heavy, flat pine woods near the shores, in large long-leaf pines, from thirty-five to sixty feet from the ground. The breeding birds were all white headed adults. The first eggs were found on November 27 and the first young on December 26. A nest with large young was seen near Bassenger, March 21.

86. *Falco peregrinus anatum*. DUCK HAWK.—A large adult female was seen on the islands near Pass-a-Grille on December 5 and again on February 7. It was shot by Mr. Fargo on March 11.

87. *Cerchneis sparveria sparveria*. SPARROW HAWK.—Birds of this species were very common on Long Key all winter. We could always count from six to twelve, sitting on the telephone poles, in driving the length of the island, a distance of five miles. As these birds nearly all disappeared before April, we inferred that they were northern birds and had migrated.

88. *Cerchneis sparveria paula*. LITTLE SPARROW HAWK.—Although none were shot, we referred the resident breeding birds to this form. Three nests containing eggs, one set nearly hatched and one fresh, were found in Hernando and Pasco Counties, April 19. They were in holes made by Flickers in dead and fire blackened pine stubs, eighteen to twenty feet from the ground, in old cut and burned over pine woods.

89. *Polyborus cheriway*. AUDUBON'S CARACARA.—A fairly common bird in the Kissimmee Prairie region and southward. Two nests with large young were found in the thick tops of cabbage palmettos near Bassenger on March 22.

90. *Pandion haliaetus carolinensis*. OSPREY.—An uncommon resident. It was seen near Pass-a-Grille on November 11 and 18 and February 28, and Mr. Fargo saw one in Pinellas Co., March 14. Two nests were noted along the Wekiva River, March 30, an occupied one on the Miakka River, March 4 and two occupied nests in the tops of large cypress trees along the Weekiwachee River, April 19.

91. *Strix varia alleni*. FLORIDA BARRED OWL.—A common resident in live oak and palmetto hammocks. One nest, previously robbed, in a hollow in a long-leaf pine, was shown to us by Mr. Baynard in Hillsborough Co. Another was found, with one young about half grown, in a natural cavity in a cabbage palmetto in a hammock near Bassenger on March 21. Mr. Fargo saw a single bird in Pinellas Co., March 12.

92. *Otus asio floridanus*. FLORIDA SCREECH OWL.—A very common resident. A nest with three fresh eggs was found in an old Flicker's hole in a cabbage palmetto in an open situation at Gulfport on April 1. On April 26 three nests, with small young, were found in Flickers' holes in dead, blackened pine stubs in burned over pine woods in Polk Co. One parent bird, taken from a nest, was intermediate in color between the grey and red phases.

93. *Bubo virginianus virginianus*. GREAT HORNED OWL.—A fairly common resident in the flat pine woods. Mr. Baynard took three sets of eggs from old Bald Eagles' nests in January in Pinellas and Hillsborough Counties.

94. *Speotyto cunicularia floridana*. FLORIDA BURROWING OWL.—A common resident in the prairie regions. Five pairs were found at their burrows on the prairie east of Punta Gorda, March 5. One burrow was dug out, but no eggs had been laid. Two or three pairs were found on the

prairies near Bassenger, March 20, and a small downy young, perhaps a week old, was taken from a nest near Plant City on April 25 by Mr. S. Leonard Cason.

95. *Ceryle alcyon*. BELTED KINGFISHER.—A resident, common in winter. Two or three birds always frequented the toll bridge, over a mile long, which connects Long Key with the mainland.

96. *Dryobates pubescens pubescens*. SOUTHERN DOWNY WOODPECKER.—A resident. Only a few were seen during the winter in the live oak hammocks, probably this subspecies.

97. *Dryobates borealis*. RED-CKCKADED WOODPECKER.—Although not very common, it was seen frequently in the flat pine woods, to which it is restricted.

98. *Sphyrapicus varius varius*. YELLOW-BELLIED SAPSUCKER.—One was seen along the roadside in Sarasota Co., March 4, and Mr. Fargo records one in Pinellas Co. in the early part of 1924.

99. *Phloeotomus pileatus pileatus*. PILEATED WOODPECKER.—A common resident in the heavily wooded river bottoms and in cypress swamps. It is rarely seen in the pine woods.

100. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—A fairly common bird locally, especially in the interior counties, in open country, burned-over pine woods and about plantations. It nests in shade trees near houses and in dead stubs in the "burns."

101. *Centurus carolinus*. RED-BELLIED WOODPECKER.—The commonest woodpecker. It is found mainly in the live oak and palmetto hammocks, where it nests, often near houses.

102. *Colaptes auratus auratus*. FLICKER.—A common resident on the mainland in open country and in the flat pine woods. A nest containing fresh eggs was found on Merritt's Island, March 29.

103. *Antrostomus carolinensis*. CHUCK-WILL'S-WIDOW.—A very common summer resident in the palmetto and live oak hammocks on the mainland and on large islands. It was first heard on March 21. It nests usually among the oaks, on the ground.

104. *Antrostomus vociferus vociferus*. WHIP-POOR-WILL.—One was seen in a live oak hammock near St. Petersburg on December 12.

105. *Chordeiles virginianus chapmani*. FLORIDA NIGHTHAWK.—A common summer resident, frequenting open country. It was not seen after November 10 until April 16.

106. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.—A fairly common summer resident. It was first seen by Mr. Fargo in Pinellas Co., March 1.

107. *Tyrannus tyrannus*. KINGBIRD.—A common summer resident. It was first seen by Mr. Fargo in Pinellas Co., March 21.

108. *Tyrannus dominicensis*. GRAY KINGBIRD.—A very common summer resident locally. It is found about the mangrove shores of islands, nesting in the red and black mangroves close to or over salt-water, early in May. It was seen first, April 14, on Bird Key.

109. *Myiarchus crinitus*. CRESTED FLYCATCHER.—A common summer resident about villages and orchards. It was first seen, March 21, at Bassenger.

110. *Sayornis phoebe*. PHOEBE.—A common winter resident about villages and in hammocks. It was seen from November 15 to March 6.

111. *Cyanocitta cristata florincola*. FLORIDA BLUE JAY.—A common resident in towns, villages and open country.

112. *Aphelocoma cyanea*. FLORIDA JAY.—A rather rare and decidedly local bird, found only on the black jack ridges, nesting in the low, scrubby oaks in April. It is very tame and unsuspicious. The only nest found was afterwards deserted.

113. *Corvus brachyrhynchos pascuus*. FLORIDA CROW.—A not very common and rather local resident. It nests in thick groves of tall, slender long-leaf pines. It was often seen in the heron rookeries with the nest species.

114. *Corvus ossifragus*. FISH CROW.—A common resident. It is a decided nuisance in the heron rookeries where it destroys great numbers of eggs.

115. *Agelaius phoeniceus floridanus*. FLORIDA RED-WING.—A common resident and widely distributed, mainly near the shores and marshy places. It was a common dooryard bird in Pass-a-Grille.

116. *Sturnella magna argutula*. SOUTHERN MEADOWLARK.—A common resident in the more open, flat pine woods.

117. *Icterus spurius*. ORCHARD ORIOLE.—One was seen by Mr. Fargo in Pinellas Co., April 1.

118. *Euphagus carolinus*. RUSTY BLACKBIRD.—Mr. Fargo records it in Pinellas Co., March 25.

119. *Quiscalus quiscula aglaeus*. FLORIDA GRACKLE.—A decidedly local resident and not very common. It was seen only in a few inland towns in small numbers.

120. *Megaquiscalus major major*. BOAT-TAILED GRACKLE.—An abundant resident on the mainland in open country and in the flat pine woods. It is often concentrated during the breeding season in large colonies in the marshes overgrown with small bushes, or in cat-tail or saw grass sloughs. One colony, examined on March 30, contained about eighty pairs with nests, containing eggs, in low "ty-ty" bushes.

121. *Astragalinus tristis tristis*. GOLDFINCH.—It is recorded by Mr. Fargo in Pinellas Co., February 17, 1924.

122. *Poocetes gramineus gramineus*. VESPER SPARROW.—A few birds, apparently of this species, were seen during the winter, and it was noted in Charlotte Co., March 5.

123. *Passerculus sandwichensis savanna*. SAVANNAH SPARROW.—A common winter resident in the salt marshes on sandy islands and in fresh-water meadows. A specimen was collected near Pass-a-Grille, April 16.

124. *Passerherbulus caudacutus*. SHARP-TAILED SPARROW.—A

common winter resident on the grassy, salt meadows. Specimens were collected in Pinellas Co., April 7.

125. *Passerherbulus nigrescens*. DUSKY SEASIDE SPARROW.—An abundant resident on the salt marshes of Merritt's Island. Specimens were collected on March 29.

126. *Spizella passerina passerina*. CHIPPING SPARROW.—A common winter resident in the open country of the interior. It was often seen along the roadsides.

127. *Peucaea aestivalis aestivalis*. PINE-WOODS SPARROW.—*P. aestivalis* was found only in the flat pine woods and was not very common. Since no specimens were collected, we cannot be certain of the subspecies.

128. *Peucaea aestivalis bachmani*. BACHMAN'S SPARROW.—One was collected by Mr. Fargo in Pinellas Co., March 30.

129. *Melospiza melodia melodia*. SONG SPARROW.—A common winter resident, last seen at Pass-a-Grille, March 3.

130. *Melospiza georgiana*. SWAMP SPARROW.—A very common bird in the coastal marshes in March and April. Specimens were taken on Merritt's Island, March 29, and in Pinellas Co., April 13.

131. *Pipilo erythrophthalmus alleni*. WHITE-EYED TOWHEE.—A common resident in the flat pine woods where there was an undergrowth of low bushes. It was also found on the oak ridges overgrown with underbrush.

132. *Cardinalis cardinalis floridanus*. FLORIDA CARDINAL.—A common resident, found mainly near towns and plantations, frequenting thickets along streams and about cultivated lands.

133. *Passerina ciris*. PAINTED BUNTING.—A male in full plumage was seen flying across a road on Long Key on April 17.

134. *Progne subis subis*. PURPLE MARTIN.—A common summer resident in the interior, nesting in gourds. A few were seen on Long Key, February 19, but they disappeared soon after that. It was noted at Ozona, February 27.

135. *Hirundo erythrogastra*. BARN SWALLOW.—A common migrant first seen in Pinellas Co., April 13.

136. *Iridoprocne bicolor*. TREE SWALLOW.—An abundant migrant. It was seen while we were driving across the State on November 8 and 9, but was not recorded until again February 14, although Mr. Fargo saw it in Pinellas Co., February 7.

137. *Lanius ludovicianus ludovicianus*. LOGGERHEAD SHRIKE.—We regarded this species as about next to the commonest one in Florida. It is a resident seen everywhere along the road sides, sitting on poles and wires, and also found very commonly in the flat pine woods.

138. *Vireo griseus* (subsp. ?) WHITE-EYED VIREO.—An uncommon resident. It was heard singing in Hernando Co., April 19, and Mr. Fargo noted it in Pinellas Co., March 24.

139. *Mniotilta varia*. BLACK AND WHITE WARBLER.—A common winter resident in live oak hammocks. It was seen on Bird Key, April 24.

140. *Protonotaria citrea*. PROTHONOTARY WARBLER.—A common migrant. It was seen at Pass-a-Grille, April 6.

141. *Compsothlypis americana americana*. PARULA WARBLER.—It is rare in winter, but a fairly common summer resident. It breeds along the rivers and about the cypress swamps, nesting in the Spanish moss. It is likely that some of the birds seen in the spring were the Northern Parula Warbler, but none of either form was collected.

142. *Dendroica tigrina*. CAPE MAY WARBLER.—A fairly common migrant. It was seen at Pass-a-Grille, April 26.

143. *Dendroica coronata coronata*. MYRTLE WARBLER.—A common winter resident.

144. *Dendroica dominica dominica*. YELLOW-THROATED WARBLER.—An uncommon resident in live oak hammocks.

145. *Dendroica vigorsi*. PINE WARBLER.—A resident, common in winter in pine woods.

146. *Dendroica palmarum palmarum*. PALM WARBLER.—An abundant winter resident in the hammocks, open country and about villages. It is one of the common dooryard birds.

147. *Dendroica palmarum hypochrysea*. YELLOW PALM WARBLER.—Only a few were seen during the winter, but it is easily overlooked among the preceding form. It was recorded on November 11 and December 12.

148. *Dendroica discolor*. PRAIRIE WARBLER.—A common migrant. It was first seen in Pinellas Co., March 3, 1924, and March 9, 1925, by Mr. Fargo.

149. *Geothlypis trichas ignota*. FLORIDA. YELLOW-THROAT.—Yellow-throats, probably of this form, were fairly common all winter in grassy, marshy places. No marked increase in numbers was noted in April.

150. *Wilsonia citrina*. HOODED WARBLER.—One bird was seen at Pass-a-Grille, March 27.

151. *Anthus rubescens*. PIPIT.—A few were seen near Bassenger on the Kissimmee Prairie on March 21.

152. *Mimus polyglottos polyglottos*. MOCKINGBIRD.—We believe this to be the commonest bird in Florida. It was abundant everywhere about human habitations and cultivated land. It began singing in February, and nests were found all through March and April in cabbage palmettos, sea grapes and various other small trees and shrubs.

153. *Dumetella carolinensis*. CATBIRD.—A common winter resident. Mr. Baynard says a few breed regularly in Florida.

154. *Toxostoma rufum*. BROWN THRASHER.—A resident, less common in winter than the preceding species.

155. *Thryothorus ludovicianus miamensis*. FLORIDA WREN.—A common resident, more often heard singing than seen in the live oak and palmetto hammocks and in scrubby thickets.

156. *Thryomanes bewicki bewicki*. BEWICK'S WREN.—One was seen by Mr. Fargo in Pinellas Co. on March 24.

157. *Troglodytes aëdon aëdon*. HOUSE WREN.—An uncommon winter resident.

158. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—A common winter resident in the grassy meadows. One was collected near Punta Gorda, March 5.

159. *Telmatodytes palustris palustris*. LONG-BILLED MARSH WREN.—A common winter resident in marshes. One was collected by Mr. Fargo at Gulfport, February 14.

160. *Sitta pusilla*. BROWN-HEADED NUTHATCH.—A few were seen in the flat pine woods, where it is resident.

161. *Baeolophus bicolor*. TUFTED TITMOUSE.—A common resident in the live oak hammocks.

162. *Penthestes carolinensis impiger*. FLORIDA CHICKADEE.—A fairly common resident in the live oak hammocks and around the edges of cypress swamps.

163. *Polioptila caerulea caerulea*. BLUE-GRAY GNATCATCHER.—A resident, abundant all winter in the live oak hammocks.

164. *Planesticus migratorius* (subsp.?). ROBIN.—It was seen occasionally during the winter, and last recorded on March 8 in Polk Co

165. *Sialia sialis sialis*. BLUEBIRD.—A resident, common in winter in the flat pine woods and in open country.

Taunton, Mass.

PTILOSIS OF THE HOUSE WREN (*TROGLODYTES
AEDON AEDON*).¹

BY RUDYERD BOULTON.

THE arrangement and distribution of feathers in oscine birds is remarkably uniform;—so much so, in fact, that one may almost search in vain for constant differences between major taxonomic groups. Many variations and adaptive modifications occur, but those differences and similarities which may be regarded as phylogenetic are few and far between. As far as known, all song birds (Oscines) are eutaxic,² with a few exceptions the aftershaft is present (Miller, 1924b), and the oil-gland is always nude.³ These three characters are important in the classification of non-passerine birds. On the other hand, natal down is absent in such unrelated oscines as Migrant Shrike (*Lanius*), Oropendula (*Gymnostinops*),⁴ Blue Jay (*Cyanocitta*),⁴ Magpie Jay (*Calocitta*),⁴ Java Sparrow (*Munia*),⁴ Cedar Waxwing (*Bombycilla*),⁴ and House Sparrow (*Passer*). Variations in the distribution of natal down in the young of passerine birds are endless, and while this field of study has not been thoroughly worked, it may eventually prove valuable in the determination of the relationships and dividing lines between genera and families.

The observations which form the basis of this paper were made while I was an assistant of Mr. S. Prentiss Baldwin at his unique Bird Research Laboratory, Gates Mills, Ohio. Mr. Baldwin's co-operation has made this paper possible and I am deeply indebted to him for permission to publish it. My thanks are also due Mr. Waldron DeWitt Miller of the American Museum of Natural History, New York City, for criticism freely and generously given.

Observations were made on living birds and later checked by an examination of specimens,—skins and alcoholics. Notes on

¹ Contribution No. 11 from the Baldwin Bird Research Laboratory.

² Miller, W. DeW. Notes on Ptilosis with Special Reference to the Feathering of the Wing. Bull. Am. Mus. Nat. Hist., XXXIV, pp. 129-140, 1915.

³ Beddard, F. E. The Structure and Classification of Birds, 1898.

⁴ Miller, W. DeW. Further Notes on Ptilosis, Bull. Am. Mus. Nat. Hist., L, pp. 305-331, 1924.

the growth and distribution of feathers were taken on 23 nestling wrens, as well as 42 nestlings of twelve other species. Two broods of wrens were studied intensively.

METHODS OF MAKING THE OBSERVATIONS.

In the first brood of six young Wrens that was studied from day to day (June 11-21, 1926), notes were made on the number and arrangement of downs (neossoptiles), the order of appearance of feather papillae and the areas in which they first developed, the progress of the feather after breaking through the skin, the rupturing and disintegration of the sheath, and the feather tracts (pterylae and apteria) were plotted. As soon as the birds were hatched, they were marked by tying a colored thread on the tarsus, loose enough so that it would not retard growth or inhibit the circulation. Silk thread was used at first, but because of the tendency of even a square knot to become untied, it was found that cotton thread was better. Various other methods of marking were tried, such as painting diagnostic marks on the body with india and indelible inks, but the continual rubbing and jostling of the birds and the abrasion of the nest material, caused the marks to become faint if not absent in twenty-four hours. Marking by means of threads was therefore adopted as being far superior to other methods.

Observations were made daily at the same hour with a hand lens of low power. Each bird was handled on an average of half an hour a day and in this time was rolled about (gently however) as no other young bird probably ever had been. When eight days old the birds were banded with their permanent Biological Survey bands. It is interesting and gratifying that all left the nest at the proper time, in no wise harmed by their novel experience, and it indicates that the popular idea, "to touch a young bird will kill it," is without any foundation. When the birds were eleven days old, three days before leaving the nest, this type of observation became unproductive of results, for the nestling downs had practically disappeared and the feather tracts had become established in their adult relationships.

Observations on the second brood of seven Wrens (August 9-18, 1926) consisted in making daily measurements of the growth of 36 feathers and their sheaths from the various tracts in different

parts of the body. The methods used were much the same as in the first brood. The birds were marked as soon as hatched and measurements commenced when the first feather had broken through the skin. These were continued daily at the same hour until all the birds had left the nest. Measurements were made with an ordinary pair of dividers, sometimes aided with a hand lens. They were read in millimeters, interpolated to tenths, and while it is not easy to hold a lively young Wren and measure various feathers, the growth curves of individual series, even when plotted on a large scale, are reasonably smooth and uniform, indicating accuracy of measurement to a marked degree.

The identification of the feathers that were measured from day to day was a problem which necessitated a little experimentation. The primaries, secondaries and tail feathers, being of definite number, could be located easily by counting, and the feathers in the various series of coverts were readily found by their relation to the larger quills which they overlaid. The small feathers in the other six tracts presented greater difficulties. Marking the feather by staining its tip was tried, but here again wear and fading made it difficult, twenty-four hours later, to be sure that the same feather was being measured. Accordingly the tips of all feathers surrounding the one to be measured were clipped off, and no difficulty was experienced later in identifying the one desired. It may be argued that the clipping of feathers affected the growth of the remaining ones in that area, but as only those parts of the feathers that were dry and thoroughly cornified were removed and their growth continued to be normal, I believe that absolutely no distortion of growth occurred.

CLASSIFICATION OF FEATHER TRACTS.

Before entering upon a minute description of distribution and growth of feathers it is deemed advisable to define the terms which I propose to use. The following arrangement of tracts and their sub-regions is in large measure adapted from Nitzsch, Dwight and Witherby, and I believe that it is applicable in detail to all oscine birds.

Capital Tract: Frontal region, Coronal region, Occipital region, Superciliary region, Loral region, Rictal region, Ocular region, Malar region, Auricular region, Post-auricular region.

Spinal Tract: Cervical region, Interscapular region, Dorsal region, Pelvic region.

Caudal Tract: Upper tail-coverts, Rectrices, Under tail-coverts, Anal circlet.

Ventral Tract: Inter-ramal region, Sub-malar region, Cervical region, Sternal region, Axillar region, Abdominal region.

Humeral Tract.

Alar Tract: Primaries, Greater Primary coverts, Middle Primary coverts, Secondaries, Greater Secondary coverts, Middle Secondary coverts, Carpal Remex covert, Lesser Secondary coverts, Marginal coverts, Alula, Alula coverts, Carpo-metacarpal coverts, Under Greater Primary coverts, Under Lesser Primary coverts, Under Middle Secondary coverts, Under Lesser Secondary coverts.

Femoral Tract.

Crural Tract: External region, Internal region.

The Caudal and Alar tracts require special comment. In this paper I will regard the first primary as the innermost, the tenth (or eleventh) as the outermost. The first secondary lies next to the first primary, the rest are numbered progressively inwards toward the ulnar-humeral joint. The various coverts are numbered to correspond with the quills which they overlie. In the Caudal Tract I regard the middle pair of rectrices as the first, and number the others progressively outwards. As in the wing, the upper and under tail-coverts are numbered to correspond with the numbers of their respective rectrices.

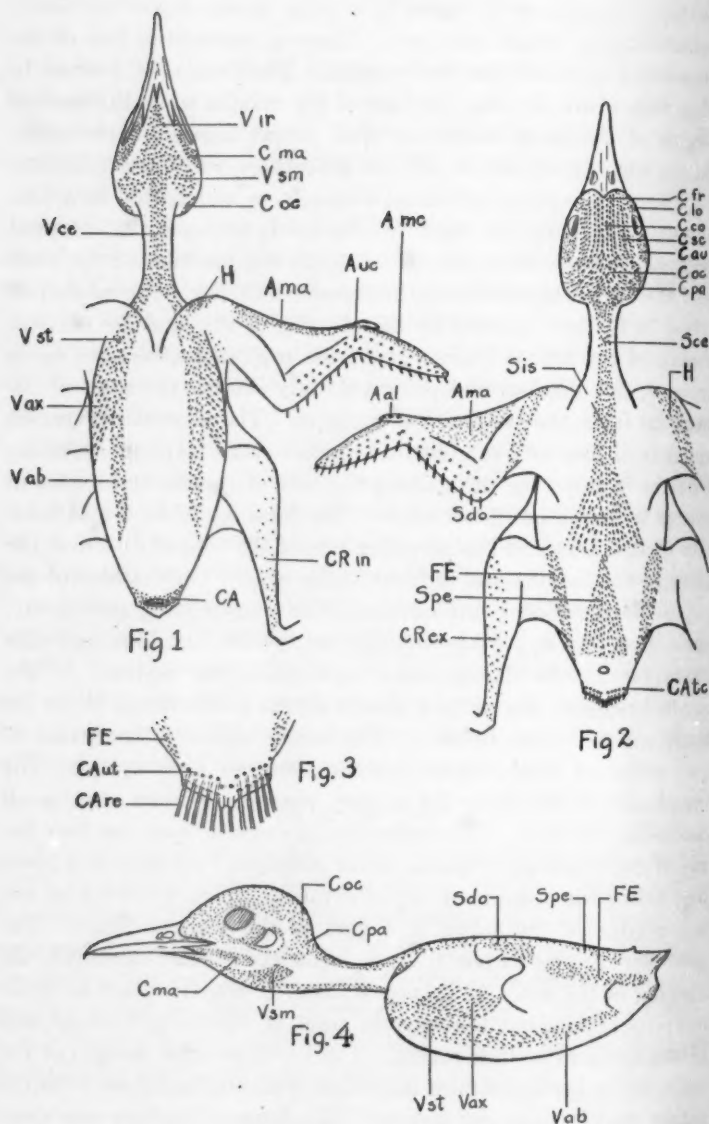
PTILOSIS OF THE ADULT.

Although the arrangement of feathers in the adult is an end result of feather growth in the nestling, the discussion of the development of tracts and the rate of growth in the latter will be more easily understood if a clear idea of the final arrangement in the adult is first established. I will therefore reverse the chronological order and describe and figure the adult first. Measurements of the mature feathers are included with those of the nestlings in Table III for the sake of comparison.

Capital Tract.

The frontal and coronal regions are composed of three rows of feathers on each side of the median line which extend from the

posterior margin of the nares to a point at the top of the head, some distance behind the eyes. There is no definite line of demarcation between the two regions. The frontal is limited to that area which lies over the base of the maxilla while the coronal begins at the point where the skull proper ascends backwardly. At the top of the head the six lines of feathers, which point directly backward, lose their individual distinctness and spread in a fan-shaped area over the back of the head, forming the occipital region. This extends approximately to the junction of the head and the neck where it forms the anterior half of a diamond-shaped whorl of feathers, caused by the meeting of this and the cervical region of the Spinal Tract. Here, the rows of feathers are again more or less distinct and point ventrally around the sides of the neck to form the post-auricular region. The superciliary region consists of four or five indistinct rows of small feathers extending from in front of the orbit along the side of the coronal region to merge with the occipital region. The loreal region is the anterior end of this area and lies on either side of the frontal region at the sides of the maxilla and in front of the eyes. The feathers of the superciliary region point outward, their bases lying proximally, their tips distally, with reference to the median line, and this character clearly distinguishes them from the feathers of the coronal region. The rictal region is absent in the House Wren for there are no rictal bristles. The ocular region is composed of two series of very minute feathers, one on each eyelid. The remainder of the lower lid is very sparsely covered with small down-like feathers. The malar region extends from the fork between the ramus and tomium of the mandible backward to a point just below the opening of the external ear where it fuses with the upper edge of the submalar region of the Ventral Tract. The auricular region occupies the area below the eye and surrounds the opening of the ear. At its upper posterior edge it meets with the occipital region, but the feathers point at right angles to the axis of the feathers of that region. The lower anterior margin of the ear opening bears the most important feathers, and these form the major part of the ear covert. The longest feathers are most anterior and point backward over the opening. They grade imperceptibly along the lower margin into the smallest which are



Key to lettering on figures 1-4.

Aal = alula and alula coverts. Ama = marginal coverts. Amc = carpometacarpal coverts. Auc = carpal remex covert. Cau = auricular region. Cco = coronal region. Cfr = frontal region. Clo = loreal region. Cma = malar region. Coc = occipital region. Cpa = post-auricular region. Csc = superciliary region. CA = Caudal Tract. CARE = rectrices. CAtc = upper tail-coverts. CAut = under tail-coverts. CRex = Crural Tract, external region. CRin = Crural Tract, internal region. FE = Femoral Tract. H = Humeral Tract. See = Spinal Tract, cervical region. Sdo = dorsal region. Sis = interscapular region. Spe = pelvic region. Vab = abdominal region. Vax = axillar region. Vce = Ventral Tract, cervical region. Vir = interramal region. Vsm = sub-malar region. Vst = sternal region.

Figure 1. Natural Size. Ventral view of adult House Wren showing pterylae and apteriae.

Figure 2. Natural size. Dorsal view of adult House Wren.

Figure 3. Enlarged, $\times 2$. Ventral view of Caudal Tract showing arrangement of rectrices, under tail-coverts and Femoral Tract.

Figure 4. Natural Size. Lateral view of adult House Wren.

most posterior and point backward also but away from the opening. The post-auricular region cannot be clearly differentiated from the occipital region. It is characterized by smaller feathers, all of which point ventrally.

Spinal Tract

The cervical region, where it meets the occipital region of the Capital Tract, forms the posterior border of the diamond shaped whorl described above. It divides medially and the feathers orient themselves to point ventrally around the sides of the neck to conform with the direction of the feathers of the post-auricular region. In the anterior part of the cervical region the feathers point forward, at about the mid point of the neck they are rotated on their bases vertically (a few at the sides of the region rotate laterally) and in the interscapular region they all point backward. This last region is very dense and sharply delimited from its adjacent apteria. At a point opposite the proximal origin of the posterior patagium of the humerus the Spinal Tract spreads laterally to form the saddle-shaped dorsal region. The posterior margin is almost truncate or slightly rounded and is slightly anterior to the line between the posterior femoral

patagia. The feathers of the sides and posterior part of the dorsal region are exceptionally long and suffice to clothe completely the back and sides of the body. These are the feathers which bear the peculiar silvery mirrors at their extremities. Immediately behind this lies the pelvic region, a triangular area with its apex touching the dorsal region and its base just anterior to the oil gland, which is of course unfeathered.

Caudal Tract

The middle tail feathers are the longest rectrices and their quills are of slightly greater diameter than are the others. They are inserted in a pair of prominent papillae which project beyond the pygostyle. The other rectrices apparently are not furnished with these papillae. The tail is strongly rounded as may be seen from the following measurements: I, 44.3 mm; II, 44.0 mm; III, 43.7 mm; IV, 43.4 mm; V, 42.0 mm; VI, 36.0 mm. The rounding is much more apparent than the measurements show, due to the fact that the bases of the feathers lie on a diagonal, not on a line at right angles to their axes. There are five pairs of upper tail-coverts, the first being absent. There are at least six pairs of under tail-coverts. The first pair lies above and posterior to the second. A pair of feathers, exactly intermediate in position, length, strength of shaft and character of web, lies between the sixth pair of coverts and the most posterior feathers of the Femoral Tract and it is questionable whether they constitute a seventh pair or not. The anal circlet consists of two concentric series of small feathers surrounding the anus. At the lateral ventral margins there are a few small scattered feathers without any definite arrangement.

Ventral Tract

The inter-ramal region is a triangular area extending from the junction of the rami of the mandible to a point immediately under the orbits. Here, on either side, the submalar regions branch off and extend in slightly widening bands until they almost meet the post-auricular regions of the Capital Tract. The cervical region runs down the ventral median line of the neck, slightly widening posteriorly until at approximately the mid-point it branches to form the two sternal regions. The feathers of these two regions

point backward and inward and serve to cover the breast and belly. On each side of the body, where the humerus articulates with the shoulder girdle, the axillar region branches off from the sternal region. It extends almost to the knee joint when the leg is folded up against the body. The feathers of this region are long and fluffy and cover the sides of the body and the flanks. They point backward and outward and thus are clearly separable from the feathers of the sternal region. From the point where the inner edge of the axillar region leaves the sternal region, the abdominal region extends, slightly decreasing in width, almost to the anus, but well on the side of the body. The feathers of this region point inward and cover the large ventral apteria.

Humeral Tract

The Humeral Tract, from which arise the scapulars or humerals, is a very dense and compact series of about four rows of feathers extending backward from the junction of the axillar region and the sternal region. It crosses over the top of the humerus from the outside to the inside, following a spiral path, and ends on the distal margin of the posterior humeral patagium. The most distal feathers of this tract can scarcely be distinguished from the most proximal secondaries.

Alar Tract

There are ten well developed primaries with what appears to be a vestigial eleventh lying on the base and slightly on the upper surface of the tenth. I cannot be sure that this feather is homologous with an eleventh primary. Its shaft is slightly stiffer and it is more lanceolate in form than the adjacent carpo-metacarpal coverts. The tenth greater covert, with which it might be confused, is almost twice as long, measuring 2.6 mm. The wing formula is 8, 7, 6, 5, 4, 3-9, 2, 1, 10, 11 (?), and the wing is very strongly rounded as may be seen from the accompanying measurements: (1), 38.0 mm; (2), 38.4 mm; (3), 38.7 mm; (4), 39.0 mm; (5), 39.4 mm; (6), 40.3 mm; (7) 40.2 mm; (8), 39.5 mm; (9), 34.0 mm; (10), 21.0 mm; (11), 1.5 mm. The apparent discrepancy between the wing formula and the measurements is due to the fact that the bases of the primaries are on a diagonal in the folded wing.

Thus the eighth primary appears to be longer than the seventh although it is actually shorter. The greater primary coverts are ten in number, the tenth being very much smaller than the rest. I can find no trace of an eleventh greater covert. There are seven middle primary coverts, the first three and the eleventh being absent. The tenth is proportionally much smaller than the others. The series of lesser primary coverts is not present in the House Wren. There are nine secondaries, each of which is provided with a greater covert. Lying beside the ninth greater covert is a feather which obviously is a tenth covert although its secondary has been lost. There are two other feathers in the same series, lying between this tenth covert and the distal feathers of the Humeral Tract, which may very well be the eleventh and twelfth coverts, but they are much smaller and their relationships are not so clear. It is very interesting that while the eighth and ninth secondaries are much reduced and the tenth is absent, the corresponding coverts are but slightly reduced, much less in proportion than their corresponding secondaries. The complete series of measurements (in millimeters) of these feathers is given in Table I.

TABLE I.

Position of feather	1	2	3	4	5	6	7	8	9	10
Secondary	38.0	38.0	37.3	35.5	34.0	32.0	31.0	27.0	22.0
Covert	16.6	16.8	17.5	17.9	17.8	17.5	16.6	16.0	14.9	14.0

There is no carpal remex but its covert is present in the same row as the greater secondary coverts and lies on the base of the first primary, more proximal than the greater covert of that feather. Its shaft is more slender than the shaft of the first greater secondary covert and it measures 8.9 mm. in length while the first covert is 15.5 mm. long. The middle secondary coverts number seven, there being no covert of this series over the first and ninth secondary. The lesser coverts lie directly over the ulna and it is difficult to distinguish them from the marginal coverts which are adjacent to them on the humeral-ulnar patagium. There is, however, a row of six feathers which, because of their different orientation and definite alignment, I regard as lesser coverts. The marginal coverts are short and densely inserted on the upper

surface of the patagium, rather longer on the extreme edge, and very sparsely distributed on the under surface. The most proximal feathers on the under side of the wing are long, plumulose and sickle-shaped. There are three alula quills which measure 14.1 mm; 12.0 mm; and 7.0 mm. in length. Their coverts which can be easily seen on the nestling's wing are difficult to distinguish in the adult. The carpometacarpal coverts extend from the pollex along the outer edge of the manus to its extreme tip. At the proximal end of this area they are continuous with the marginal coverts. The feathers are small, slightly plumulose and are sharply demarked from the adjacent apteria on both under and upper sides of the wing. All the coverts on the under side of the wing are smaller and more plumulose than the corresponding feathers of the upper side. There are ten under greater primary coverts and ten under lesser primary coverts. It will be noticed that this last series is not present on the upper surface and the middle coverts, well developed on the upper surface, are totally absent underneath. The under carpal remex covert is but 5.0 mm. long and a very different appearing feather from the corresponding feather on the upper surface of the wing, being much more downy and weaker. The under secondary coverts are difficult to homologise in the material at hand. There are two series of soft downy feathers which are presumably the middle and lesser under coverts. In the former there appear to be eight, in the second, seven feathers.

Femoral Tract

This tract extends from the anterior end of the knee, when the leg is drawn up against the body, along the sides parallel to the Spinal Tract and almost to the anus. The posterior part of this tract merges with the under tail-coverts.

Crural Tract

The external and internal surfaces of this tract are found on the tibia extending from the scutellation of the tarsus slightly more than half way to the tibia-femur joint. They are irregularly arranged and the internal surface is less densely clothed than the external surface. The most distal feathers are shortest, the proximal feathers longest.

Aftershaft

The aftershaft is not well developed in the House Wren. A feather from the dorsal region measuring 26.0 mm. in length had an aftershaft of 11.5 mm., while in one from the abdominal region measuring 10.0 mm. the aftershaft was only 2.0 mm. long. The remiges have only a single row of barbs extending across the ventral surface of the shaft at the base of the web.

Filoplumes

These degenerate feathers are well developed and traces at least are found in all of the major tracts. In no case, however, are they long enough to extend beyond the contour feathers, as they do in some of the *Timaleidae* and *Turdidae*. One from the dorsal region measured 7.5 mm., and in the axillar region one was found measuring 8.5 mm. in length. There is at least one filoplume at the base of each of the remiges and rectrices.

Downs (Plumulae)

Apparently the down feathers of the adult are found only on the apteria and along the edges of the pterylae. I do not find any downs growing among the contour feathers. The abdomen or ventral apterion of the adult male is fairly well covered with short, silky downs of a bluish gray color. In the adult breeding female, however, these are not present. I have not determined whether their absence is due to wear or whether a moult of these feathers takes place at the beginning of the period of incubation. Whichever is the case, the result is the same, namely, that the bare skin of the abdomen in its increased vascular condition and consequent higher temperature can be applied directly to the eggs. In the femoral-spinal apteria and in the axillar apteria the downs in both sexes are present.

GROWTH OF FEATHERS IN THE NESTLING

While a newly-hatched Wren is helpless, blind and practically naked, its feathers are well started in their development. The sheaths have not, however, pushed through the skin, although in some cases they may be faintly seen as dark bluish gray spots or streaks. I have not made an histological examination of these

embryonic feathers, but it is my opinion that their visibility depends on the amount of pigment deposited in them, a condition which does not appear to be correlated with the actual time of hatching. In the majority of young birds no sign of feathers is visible but in one, less than an hour old, the rectrices showed faintly, and in another about two hours old, the secondaries and the proximal five or six primaries were barely discernible.

Downs (Neossoptiles)

The first feathers of a young Wren, the neossoptiles, are present when it is hatched. They appear to have attained their full size before the bird emerges from the egg. As they are attached to the tips of the forthcoming contour feathers (Jones 1907), it is obvious that they may lengthen only as much as the distance from the tip of the feather to the surface of the skin. In order to substantiate this further, I attempted to mark a definite point on a down with ink and measure the feather from day to day. Although these results were inconclusive due to wear and fading of the ink spot, it was evident that no appreciable growth took place. The history of the neossoptiles is one of continual disintegration. From the moment the young bird is hatched, wear, abrasion of the nest, and jostling by other nestlings and the parent combine to break the tips, strip off the barbules and even remove the downs entirely. By the time the birds have left the nest only a few filaments remain attached to the juvenal feathers (teleoptiles).

The neossoptiles are arranged in a fairly definite pattern. An examination of over one hundred young Wrens revealed that they were confined to the coronal, occipital and dorsal regions. There is a certain amount of variation in the number of downs in each region as will be seen from the accompanying table. Typically there are five neossoptiles on each side of the coronal region. These are attached to the tips of the outermost row of feathers and extend from a point slightly anterior to the eye to a point slightly posterior. In the occipital region there are four downs in a double row on each side of the median line slightly anterior to the diamond shaped whorl. In the dorsal region there are three downs on each side with one at the posterior end on the median line.

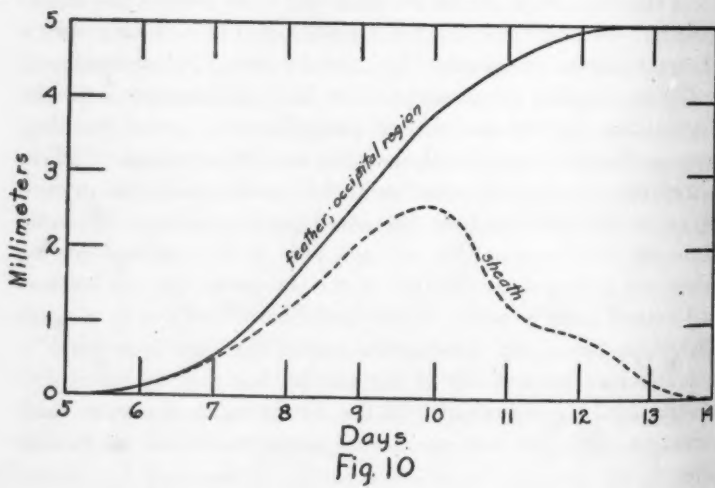
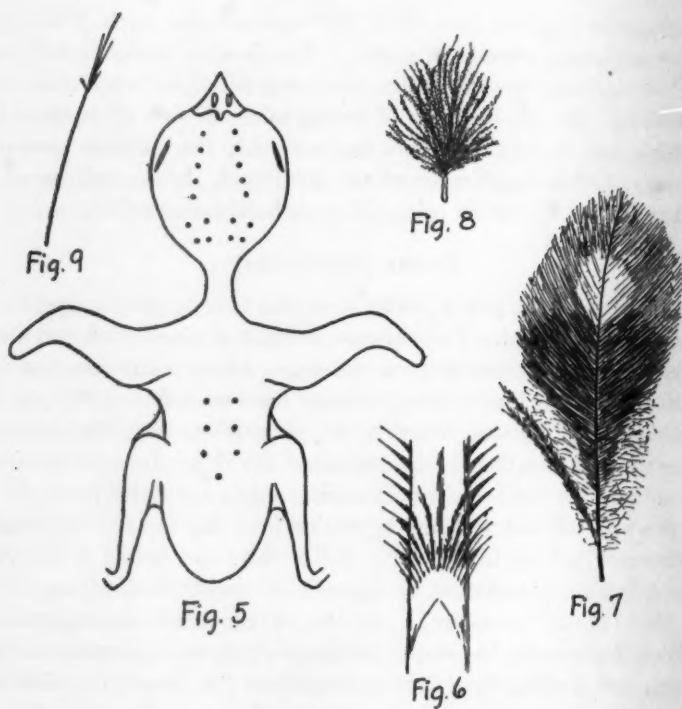


Figure 5. Enlarged, $\times 2$. Dorsal view of nestling House Wren showing arrangement of neossophtiles.

Figure 6. Enlarged, $\times 10$. Ventral view of shaft of fourth secondary of adult showing rudimentary aftershaft.

Figure 7. Enlarged, $\times 2$. Feather from dorsal region of adult showing aftershaft.

Figure 8. Enlarged, $\times 4$. Down (plumule) from axillar apteria of adult.

Figure 9. Enlarged, $\times 10$. Tip of filoplume measuring 8 mm. in length, from dorsal region of adult.

Figure 10. Graph showing the disintegration of the feather sheath in the occipital region. This is typical of all contour feathers. After the twelfth day the feather grows slowly. Until the tenth day the feather grows more rapidly than the sheath breaks, but after the tenth day disintegration takes place at a rapid but irregular rate and by the fourteenth day the sheath has entirely disappeared.

TABLE II

VARIATION IN THE NUMBER OF NEOSSOPTILES IN 15 NESTLING WRENS.

	Min.	Avg.	Max.
Coronal right.....	3	5.5	8
Coronal left.....	4	5.3	7
Occipital right.....	3	4.0	5
Occipital left.....	4	4.0	5
Dorsal right.....	2	3.3	5
Dorsal left.....	2	3.5	5
Dorsal median.....	0	.6	1

When the young bird is first hatched, there appear to be filaments of down at the tips of both the rectrices and remiges. Each filament is less than half a millimeter long and consists of a single shaft without any barbs or barbules. It may be that this structure is merely the attenuated tip of the forthcoming feather sheath. I am inclined, however, to regard it as a neossophtile, probably degenerate, although possibly primitive, but I have not made an histological examination of it.

Capital Tract

First Day. There is no sign of developing feathers.

Second Day. The first sign of feathers (or rather feather sheaths which can be seen through the semi-transparent skin) is at the center of the frontal region. Development proceeds backward

along the two middle rows of coronal feathers. At the same time it spreads laterally to include the rest of the frontal and loreal regions and the lateral rows of the coronal regions.

Third Day. Most of the sheaths in the frontal and coronal regions and those in the center of the occipital region show clearly, but none have pushed through the skin. At the lower anterior margin of the external ear opening (auricular region) a few sheaths show faintly.

Fourth Day. All the sheaths of the frontal, coronal and occipital regions show through the skin. Development of the feathers in the auricular region proceeds backwards from the most anterior point, being most rapid on the lower margin of the ear opening and much slower on the upper margin. In the anterior half of the malar region two and possibly three rows of sheaths show.

Fifth Day. Development of the auricular region has proceeded so far that the circlet of sheaths around the ear opening is almost complete, those at the anterior margin being largest. Development of sheaths has extended from the occipital region down into the post-auricular region. Almost all the sheaths show in the malar region.

Sixth Day. Feather sheaths have just broken through the skin in the frontal and coronal regions and in the center of the occipital region. Those in the frontal region appear first and are followed by the sheaths in the coronal and occipital regions. The loreal and post-auricular regions still completely underlie the skin. The innermost sheaths of the superciliary region are beginning to show.

Seventh Day. Sheaths at the anterior margin of the ear opening have just emerged from the skin, as have also those of the most dorsal part of the post-auricular region. Most of the frontal, coronal and occipital sheaths are outside the skin. Sheaths of the superciliary region show distinctly under the skin.

Eighth Day. The tips of the sheaths in the centers of the frontal and coronal regions are broken, exposing the feathers. In the auricular region all the sheaths have emerged except on the posterior upper margin. Sheaths of the inner row of the malar region, nearest the median line are longest, those of the center row are just emerging outside the skin, while the sheaths of the outer

row, which is slightly irregular, still underlie the skin. In the superciliary region the sheaths are beginning to push through the skin, and those of the ocular region on the upper and under eyelid are just beginning to show under the skin.

Ninth to Fifteenth Days. All of the sheaths having emerged, this period is merely one of active growth and disintegration of the feather sheaths. In general, the sheaths of feathers most subject to wear and abrasion are the first to break and expose the feathers within. It is generally true, however, that the sheaths which have emerged first are the ones most likely to disintegrate first. In support of the latter case, the sheaths at the anterior margin of the ear opening break before the others of this region, all being subjected to about the same amount of wear. On the other hand, the sheaths at the anterior end of the malar region are protected by the projecting edges of the tomium and ramus, and by the "wattle" at the gape. Therefore, although they are the first to emerge from the skin, they are the last to expose their enclosed feathers. On the twelfth day the tips of all sheaths except those of the loreal and ocular regions, are broken, exposing the feathers. In one nestling at this stage only two neossophtiles remained on the coronal region and two on each side of the occipital region.

Spinal Tract

First Day. When the young bird is about 20-24 hours old, traces of sheaths can be detected under the skin. Apparently those in the cervical region are the first to appear, closely followed in order by those of the interscapular, dorsal and the base of the pelvic regions.

Second to Fifth Days. The center of development seems to be the mid-point of the cervical region, and sheaths appear from there progressively forward along the median line to the occipital region of the Capital Tract and progressively backwards to the posterior margin of the dorsal region. The pelvic region in its development is quite distinct from the rest of the Spinal Tract, for here the first sheaths to appear are at the posterior margin, followed by others more anterior. This causes the apex of the pelvic region to lag behind the rest of the tract, not only in first appearance of the sheaths but in all the other phases of development. It is con-

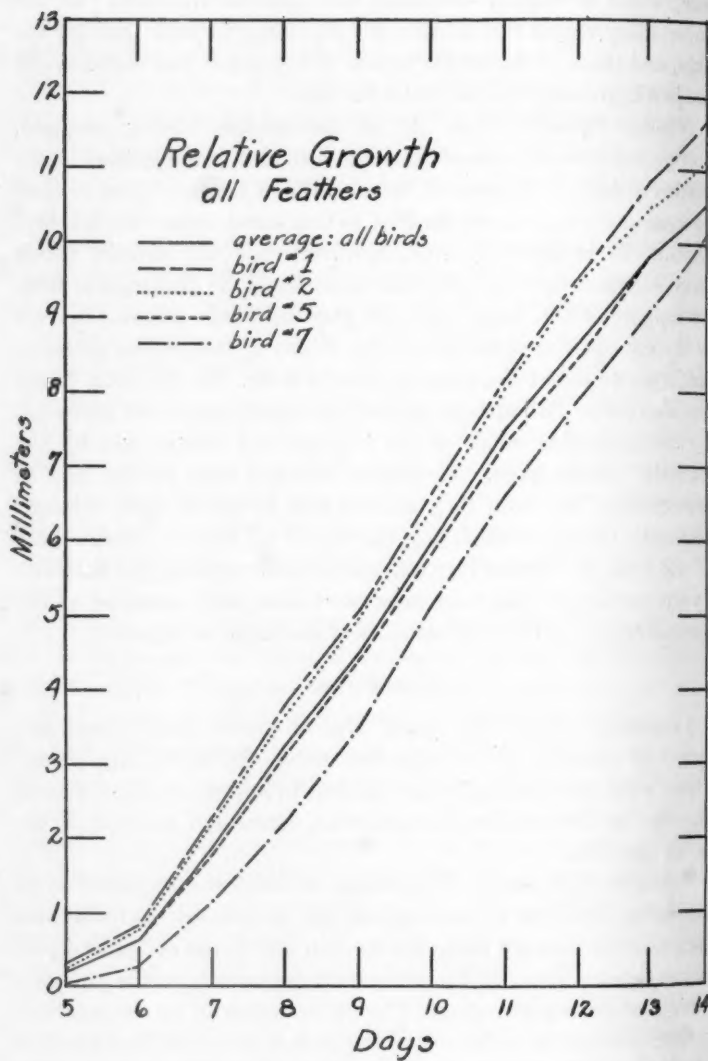


Fig. 11

Figure 11. Graph showing the relative feather growth in nestling House Wrens. The data for this was obtained by taking the mean of the daily measurements of thirty-six feathers of each bird. It is therefore an index of feather growth as a whole. It will be noticed that the curve for the seventh bird runs considerably behind the average for all birds and the curve for the first bird is somewhat in advance of the average. This is taken to indicate that the birds which are hatched first are more vigorous and grow relatively faster than those which are hatched later.

venient, therefore, to refer to it as the "pelvic constriction." At about the fifth day this area is filled by a single line of sheaths showing underneath the skin, and there is no longer any hiatus between the dorsal and pelvic regions.

Sixth Day. Although the cervical region was the first to develop by a very slight margin, the dorsal region has by this time outstripped it, and on the sixth day some of its sheaths begin to push through the skin. Curiously enough, they first come through at the lateral and posterior margins, and it is at this place only that development begins at the periphery of a region and proceeds inward toward the center. Coincident with the first appearance of sheaths outside the skin in the dorsal region is the further development of the posterior margin of the pelvic region. Here the sheaths push through first and the more anterior ones follow them, gradually closing the pelvic constriction.

Seventh to Ninth Days. By this time all the sheaths have emerged from the skin and the tips of those in the dorsal and pelvic regions have broken, exposing the feathers. The lateral margins of the dorsal region and the posterior margin of the pelvic region show the greatest disintegration of the sheath.

Tenth to Fifteenth days. On the tenth day the sheaths of the cervical and interscapular regions burst their tips and expose the enclosed feathers. During these last five days growth, with an accompanying reduction of sheaths, is rapid, and by the time the young birds leave the nest, their backs appear to be uniformly and continuously feathered.

Caudal Tract

First Day. The rectrices do not show underneath the skin when the bird is first hatched, but at the age of about four hours the

first pair shows faintly, followed by the others. The sixth pair of tail feathers can be seen before the bird is twenty-four hours old.

Second to Fifth Days. On the second day the upper coverts can be detected under the skin. Apparently they all appear at about the same time. The under coverts are first seen on the third day. The sixth pair develops first, followed by the others in order. The first pair appears by the end of the fourth day. On the fifth day a few small sheaths show at the lateral lower margins of the anal circlet. In this region development proceeds from these two points as centers in both directions around the anus to meet in the median line at the anterior and posterior margins.

Sixth Day. The upper-tail coverts push through the skin. The second pair shows first closely followed by the others in order, the sixth appearing last. The anal circlet is not entirely complete, there being slight gaps at the median line on the anterior and posterior margins.

Seventh Day. The rectrices begin to emerge, the sixth pair being the first to show, the first pair the last. For all practical purposes, however, they all push through the skin at the same time as there is almost no difference in length after they are long enough to measure. The outermost (sixth) under tail-coverts also show outside the skin.

Eighth to Fifteenth Days. By the end of the eighth day all sheaths have emerged except those of the outer anal circlet. By the tenth day these also have pushed through the skin. Between the eighth and eleventh days the tips of all sheaths burst and expose their feathers. After this, rapid growth and disintegration of feather sheath are the only events worthy of note. The last sheaths to appear are those which lie between the anal circlet, the under tail-covert region and the Femoral Tract.

Ventral Tract

First Day. There is no sign of developing feathers.

Second and Third Days. At the end of the second day sheaths begin to show in the axillar region. Development proceeds anteriorly and by the end of the third day sheaths can be seen throughout the sternal regions and on the cervical region to a

point slightly in advance of the junction of the two former areas. The most lateral rows of sheaths in these regions are the first to develop. In the abdominal regions the two lateral rows of sheaths can be seen to the extreme posterior end of the tract. Simultaneously with the expansion of this center of development, the sheaths of the anterior and lateral margins of the inter-ramal region begin to show. From this center, development spreads backward, eventually meeting the expansion of the axillar developmental center at about the mid point of the cervical region.

Fourth to Sixth Days. On the fourth day all the sheaths of the inter-ramal region appear and those on the dorsal margin of the sub-malar region show under the skin as far back as the anterior margin of the eye. By the end of the fifth day the two centers of development have coalesced in the mid-point of the cervical region and all the sheaths of the sub-malar region can be seen under the skin. On the sixth day the sheaths at the posterior lateral margin of the axillar region begin to emerge, together with those of the inner margin of the sternal region.

Seventh and Eighth Days. During this period all the sheaths emerge. The last to push through the skin are those which lie in the cervical region at the point where the two centers of development joined. Many of the sheaths are broken at the tip and expose their enclosed feathers. The greatest wear and abrasion undoubtedly occurs on the abdominal regions, and all of these feathers are exposed, although they were not the first to be developed and are much shorter than many others in this tract.

Ninth to Fifteenth Days. During this period no further modifications or developments take place. The last feathers to be exposed are those of the inter-ramal region where a minimum of abrasion occurs.

Humeral, Femoral and Crural Tracts

First Day. There is no sign of feather sheaths.

Second Day. In the Humeral Tract, a few sheaths in the most distal row begin to show faintly under the skin. The dorsal row of sheaths of the Femoral Tract can be seen.

Third to Fifth Day. During this period, development of sheaths in the Humeral Tract proceeds from the posterior distal margin

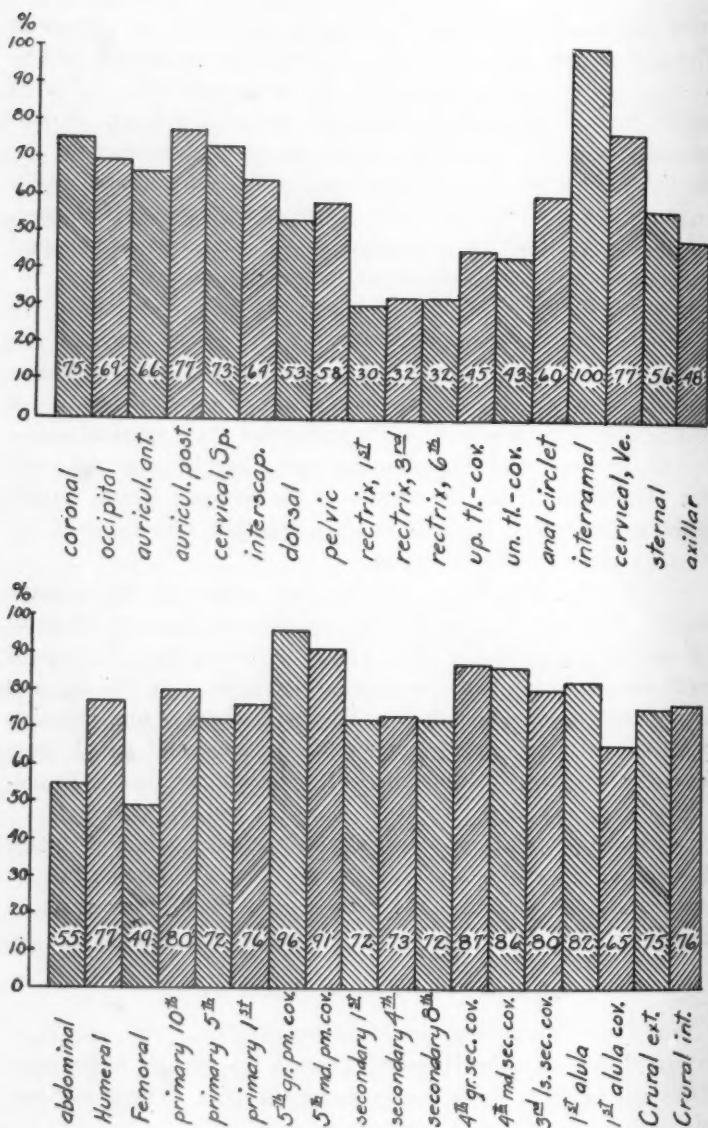


Fig. 12

Figure 12. Graph showing the percentage of ultimate growth which thirty-six characteristic feathers have attained by the time the young birds leave the nest. This is calculated on the basis of one hundred for the same feathers in the adult. It is interesting that the anterior end of the body (Capital Tract and anterior end of the Ventral Tract) is well advanced, varying from 66% to 100%, while the posterior end of the body is relatively little advanced, varying from 30% to 60%. The important feathers of the wing and tail show remarkably constant percentages; rectrices, 30-32%, primaries, 72-80%, secondaries, 72-73%. Less important feathers, as regards size, position and function show greater extremes, although they are obviously of close relationships; auricular anterior, 66%, auricular posterior, 77%; first alula feather, 82%, first alula covert, 65%.

forward. At the proximal end, the tract is almost continuous with the sternal region, and at the distal end, with the alar tract. In the Femoral Tract development proceeds from the dorsal anterior margin backward and by the end of the fifth day all of the ultimate feathers are indicated by their sheaths. On the third day sheaths first appear in the Crural Tract at the lower posterior margin of the external region. Soon after others appear at the anterior edge and then development extends upward, all the sheaths in the region showing by the end of the fifth day. On this day a few sheaths can be seen underlying the skin at the lower end of the internal region.

Sixth and Seventh Days. In the Humeral Tract sheaths begin to push through the skin at the posterior distal margin. In the anterior end of the Femoral Tract the cornified feather follicles first appear outside the skin, development proceeding backward. The most distal sheaths of the Crural Tract also emerge.

Eighth to Fifteenth Days. During the first few days of this period the sheath tips of all three tracts burst or are worn away and expose their feathers. The latter part of nestling life is characterized by rapid growth of the feathers and disintegration of the feather sheath, designed to provide the young bird with nearly uniform and continuous feathering by the time it leaves the nest.

Alar Tract

First Day. No sheaths can be detected underneath the skin when the bird is first hatched, but very soon thereafter, perhaps

two or three hours, the primaries and secondaries begin to appear. The most distal secondaries, that is, the first, second, third and so forth, are apparently the first to appear, closely followed by the others. The seventh, eighth and ninth do not appear until the second day. The fourth, fifth and sixth primaries seem to be the first to show, followed soon after by the others, both inner and outer. The sequence of appearance is so rapid that it is difficult to say which one is actually the first to be developed, but the middle of this series definitely appears before either the innermost or outermost.

Second Day. By the end of the second day the major regions of the wing, except those of the under surface, have been delimited. All of the primaries and secondaries can be seen. The greater primary coverts, development apparently proceeding from the middle of the series outward, three alula quills, the first (most distal) appearing first, and the alula coverts, have made their appearance. All of the greater, middle and lesser secondary coverts are well defined, as well as the innermost row of marginal coverts. In the last four series, development apparently begins at the distal end of the region and proceeds towards the proximal end.

Third Day. The carpo-metacarpal coverts appear at the distal end of the manus. Some of the primaries and secondaries and their major coverts are just beginning to show outside the skin.

Fourth and Fifth Days. The carpo-metacarpal coverts increase in size and prominence. The series of lesser secondary coverts grade imperceptibly into the marginal coverts which are best developed at the distal end of the region. A few more of the larger feathers emerge from the skin but on the fourth day at least, this is fortuitous and the general period of emergence has not yet begun. On the under surface of the wing, a few sheaths can be detected showing through the skin, but they are poorly developed and their relationships obscure.

Sixth Day. Practically all the feathers of the wing begin to emerge on this day. Primaries, greater primary coverts, secondaries, greater, middle and lesser secondary coverts, marginal coverts, alula and alula coverts have all pushed their way through the skin. The carpal remex covert and the carpo-metacarpal coverts are still covered by skin.

Seventh and Eighth Days. Curiously enough the tips of the greater coverts, primary, secondary and alula, are the first to break and expose the enclosed feathers. The tips of the carpo-metacarpal coverts also burst, probably due to excessive wear, although the feathers themselves are very short, less than 2 mm. in length. The coverts of the under wing emerge from beneath the skin.

Ninth to Fifteenth Days. During this period the wing feathers lengthen greatly, their sheaths break and disintegrate so that by the end of the nestling period, practically the entire feathers are exposed. The diameter of the carpal remex covert, as long as its sheath is present, appears to be about one-half that of the adjacent greater primary and secondary coverts. The feathers in the series of under wing-coverts lag behind all other feathers in the wing. This is paralleled by the internal surface of the Crural Tract and is perhaps occasioned by the fact that, in both cases, the feathers in question are closely applied to the body, light and free circulation of air being excluded. At first sight, however, this interpretation seems to be rather bizarre, as undoubtedly the rate of growth is determined by internal metabolic factors before the feathers emerge and is not influenced by external stimuli. Perhaps the explanation is due to the fact that these feathers have largely lost their function and are in a sense vestigial, as is evident from their structure.

In Table III are given the measurements of the growth of thirty six feathers in the various tracts. Each measurement for each day is an average of the measurements of seven birds belonging to one brood and is a fairly typical index of the growth of the feathers concerned.

SUMMARY

While, in general, young Wrens at the time of hatching show no external trace of their future feathering, a few are hatched in a more advanced stage in this respect.

The distribution of neossopiles is constant but the number of individual downs is subject to a certain amount of variation.

The neossopiles do not grow after hatching but are pushed out of the skin on the tips of the forth-coming contour feathers.

The first appearance of feathers and the sequence of their de-

TABLE III.
(MEASUREMENTS IN MILLIMETERS.)

	Age in Days	5	6	7	8	9	10	11	12	13	14	adult
Coronal.....	0.0	.3	1.0	2.2	3.1	3.7	4.2	4.9	5.1	5.2	7.0	7.6
Occipital.....	0.0	.2	1.4	1.9	2.8	3.7	4.3	5.0	5.1	5.2	7.6	7.6
Auricular (anterior).....	0.0	0.0	.3	1.0	1.6	2.2	2.8	3.1	3.7	4.0	6.0	6.0
Auricular (posterior).....	0.0	0.0	.2	.5	.7	1.6	1.9	2.6	2.7	3.0	3.9	3.9
Cervical (Spinal).....	0.0	.1	.8	2.4	3.6	5.0	7.2	8.3	9.9	11.0	15.0	15.0
Interscapular.....	0.0	.3	1.5	2.8	4.1	6.0	8.1	10.5	11.6	18.0	24.0	24.0
Dorsal.....	.1	.4	1.7	3.3	4.6	6.1	8.0	10.3	11.4	12.8	17.0	17.0
Pelvic.....	0.0	.4	1.2	2.5	3.2	4.5	6.0	6.5	8.3	9.8	13.1	13.1
Rectrices (first pair).....	0.0	.1	1.0	1.8	2.9	4.6	6.8	8.3	10.9	13.1	44.0	44.0
Rectrices (third pair).....	0.0	.2	1.2	2.1	3.3	5.5	7.2	9.5	11.7	14.1	43.7	43.7
Rectrices (sixth pair).....	0.0	.2	1.2	2.1	3.2	4.7	6.4	7.9	9.7	11.5	36.0	36.0
Upper tail-coverts.....	0.0	.1	1.2	2.2	3.3	4.7	6.4	7.2	8.7	9.9	20.0	20.0
Under tail-coverts.....	0.0	0.0	.6	1.7	2.6	3.7	5.2	6.0	7.4	9.4	21.0	21.0
Anal circlet.....	0.0	0.0	.1	.1	.9	1.3	1.7	2.1	2.8	3.2	5.5	5.5
Interramal.....	0.0	0.0	.2	.8	1.1	1.9	2.3	2.5	3.5	3.8	3.8	3.8
Cervical (ventral).....	0.0	0.0	.5	1.2	1.9	2.6	3.6	4.2	4.5	5.4	7.0	7.0
Sternal.....	0.0	.4	1.5	2.6	3.8	5.1	6.6	8.4	8.8	10.1	18.0	18.0
Axillar.....	.1	.5	1.7	3.1	4.7	6.4	8.4	9.8	11.5	12.4	26.0	26.0

TABLE III (Continued)

Age in Days	5	6	7	8	9	10	11	12	13	14	adult
Abdominal.....	0.0	.2	.8	1.9	2.7	3.9	5.6	6.3	6.9	8.2	15.0
Humeral.....	.1	.8	2.2	3.5	5.0	6.9	8.5	9.8	11.6	12.3	16.0
Femoral.....	0.0	.6	1.9	3.3	4.1	5.6	6.3	6.8	8.2	9.3	19.0
Primary (tenth).....	.7	2.0	4.0	5.9	7.6	9.5	11.3	13.1	14.6	16.2	21.0
Primary (fifth).....	1.0	3.0	6.5	9.8	13.1	16.7	20.4	23.0	25.4	28.2	39.4
Primary (first).....	.9	2.5	6.0	9.3	11.9	15.7	18.9	21.7	25.1	28.6	38.0
Fifth greater primary covert..	0.0	1.3	3.4	5.5	6.9	8.9	10.2	11.3	11.4	12.0	12.5
Fifth middle primary covert..	0.0	0.0	.9	1.9	2.2	2.7	3.1	3.1	3.1	3.2	3.5
Secondary (first).....	.9	2.5	5.9	8.6	11.7	15.2	18.8	21.9	24.2	27.2	38.0
Secondary (fourth).....	.8	2.2	5.4	8.1	11.1	14.3	17.8	20.6	23.3	25.8	35.5
Secondary (eighth).....	.6	1.4	3.6	5.9	7.9	10.4	13.0	15.3	17.7	19.5	27.0
Fourth greater secondary covert.....	.7	1.6	4.1	6.0	7.8	9.9	12.3	14.0	15.1	15.5	17.9
Fourth middle secondary covert.....	0.0	1.0	2.0	3.1	4.1	5.3	6.4	7.1	7.5	7.8	9.0
Third lesser secondary covert.	0.0	.1	1.0	2.0	2.8	3.9	5.0	5.5	6.2	6.8	8.5
Alula (first).....	.5	1.4	3.0	4.3	6.0	7.8	9.7	10.7	11.4	12.6	14.1
Alula covert (first).....	0.0	.7	1.0	1.7	2.2	2.7	3.4	3.5	3.6	3.9	6.0
Crural (external).....	0.0	.1	.7	1.6	2.2	2.7	3.6	3.8	4.3	4.5	6.0
Crural (internal).....	0.0	0.0	.3	1.1	1.5	1.7	2.6	2.9	3.0	3.8	5.0

velopment in the various regions follow in definite pre-determined order, constant for any one region but varying among different regions.

Development usually begins at one side or end of a region and spreads progressively over it until growth is completed.

In at least one case (primaries), development begins in the middle of the region and proceeds simultaneously toward each end.

In another case (Ventral Tract), there are two centers of development. One appears in the middle of the tract and spreads both posteriorly and anteriorly. The other starts in the inter-ramal region and spreads backward until it meets the anterior portion of the other developmental center. In the Spinal Tract is found a somewhat parallel case.

The feather sheath, after emerging from the skin, has no function and its rate of disintegration is primarily correlated with the amount of abrasion to which it is exposed.

The growth of feathers appears to be retarded until the second week of nestling life, but, to a large extent, this is actually due to the fact that development is going on beneath the skin during the first week and is often over-looked, while the rupture of the feather sheath and consequent exposure of the feather during the second week makes growth appear more noticeably.

BIBLIOGRAPHY.

- 1840, NITZSCH, C. L., *Pterylography* (English translation edited by P. L. Slater in 1867 for the Ray Society) pp. 1-178.
- 1898, BEDDARD, F. E., "The Structure and Classification of Birds."
- 1900, DWIGHT, JONATHAN, 'Moult and Plumages of the Passerine Birds of New York,' *Ann. N. Y. Acad. Sci.*, XIII, pp. 73-360.
- 1907, JONES, LYND, 'The Development of Nestling Feathers,' *Laboratory Bull. No. 13*, Oberlin College, pp. 1-18, 8 plates.
- 1915, MILLER, W. DEWITT, 'Notes on Ptilosis with Special Reference to the Feathering of the Wing,' *Bull. Am. Mus. Nat. Hist.*, XXXIV, pp. 129-140.
- 1920, WITHERBY, H. F., "A Practical Handbook of British Birds," Vol. I.
- 1924a, MILLER, W. DEWITT, 'Further Notes on Ptilosis,' *Bull. Am. Mus. Nat. Hist.*, L, pp. 305-331.
- 1924b, MILLER, W. DEWITT, 'Variations in the Structure of the After-shaft,' *Am. Mus. Novitates*, No. 140, pp. 1-7.
- Amer. Mus. Nat. History,*
77th St. and Central Park, W., New York.

GENERAL NOTES

Horned Grebe in Breeding Plumage in North Carolina.—A Horned Grebe (*Colymbus auritus*) in full breeding plumage was taken at Norlina, N. C., about April 9, 1927. It was a female and the first specimen of either sex that I have seen in this plumage from the State.—H. H. BRIMLEY, Department of Agriculture, Raleigh, N. C.

Masked Duck (*Nomonyx dominicus*) in Texas.—On January 2, 1927, I noticed in a pile of dead Ducks at Eagle Nest Lake, Brazoria Co., Texas, a "Ruddy" Duck with peculiar white markings on the head. Feeling sure that it must be a Masked Duck I expressed a wish to have it for my collection and Mr. B. W. Cammer, who had shot it, very gladly exchanged it for a Gadwall.

On dissection I found it to be a male but on consulting the figures of male and female in Forbush's 'Birds of Massachusetts.' I found that the head markings of my bird corresponded to those of the female. I then sent the skin to Dr. H. C. Oberholser of Washington and asked whether he thought I had made a mistake in dissection. The skin was returned to me, however, with simply "*N. dominicus*. H. C. O." written on the label. I imagine my specimen is a male that has not acquired full adult plumage.

The Masked Duck is a tropical American species occurring frequently in the West Indies and five times recorded in the United States: Albury Springs, Vt., September 26, 1857; Near Newville, Wis., November, 1870; Malden, Mass., August 27, 1889; Brownsville Tex., July 22, 1891; and Elkton, Md., September 8, 1905. The first specimen, however, had its wings clipped and was evidently escaped from captivity so that my specimen is really the fifth for the United States. I have presented it to the Biological Survey section of the National Museum collection, as it seemed too rare to remain in a small private collection.—ROBERT B. LAWRENCE, Houston, Texas.

Snake-bird (*Anhinga anhinga*) in South Carolina.—During the last few days of January, and until February 19, 1926, mild, spring-like weather prevailed along the South Carolina coast. The writer was afield several times but noted nothing of particular interest until February 11, when, at a fresh water reservoir, about 15 miles from Charleston, S. C., a Snake-bird was observed.

It was a female, and apparently in fine plumage. It was seen from a highway trestle which spans the reservoir, sitting in the top of a small cypress tree about 20 feet high, and remained in this tree until after dark. It was first seen about 5:30 p. m. on a clear afternoon, and watched through 6 × glasses at a distance of about 100 yards.

As this is the fourth winter occurrence of *Anhinga anhinga* in South Carolina, the other dates may be of interest. On each occasion warm weather had prevailed for some time, but as the other records were made at intervals of about a month, all observances really cover but two warm spells. It was seen on Back River, S. C., on November 30, December 30, 1913, and January 18, 1914, all observations being made by Mr. Caspar Chisolm of Charleston.

The Snake-bird usually makes its appearance in South Carolina during the second week in March, in forward seasons, and is always abundant by the 21st of that month. (Wayne).

The writer was accompanied on the above trip by his wife, Mr. E. B. Chamberlain of the Charleston Museum, and Mr. F. M. Weston, of Pensacola, Florida, all of whom are thoroughly familiar with the species.—ALEXANDER SPRUNT, JR., *Charleston Museum, Charleston, S. C.*

Farallon Cormorant Killed by Unusual Accident.—In April, 1921, after a rather severe storm in western San Diego County, Henry Gray, a taxidermist residing in Mission Valley, picked up an adult female Farallon Cormorant, (*Phalacrocorax auritus albociliatus*), from under a telephone cable running in front of his house. A large black mark, made by the insulation, was plainly visible on the lower part of the bird's neck. The bird, probably being driven before the storm at great speed, struck the cable with such force that its neck was completely severed, but in such a way that the skin was not broken. The specimen was mounted and is now on exhibition in the museum room of the O'Rourke Zoological Institute, still retaining the stripe of tar as a witness of its accidental death.—JACK C. VON BLOEKER, *O'Rourke Zoological Institute, San Diego, California.*

The Glossy Ibis in Delaware.—The Memorial Day outing of the Delaware Valley Ornithological Club this year took the form of a three day automobile trip to Milford, Del., from which, as headquarters, excursions were made to various localities in that State and Maryland.

On the return trip on the afternoon of May 30, 1927, our car stopped on the edge of an open marsh on the outskirts of Wilmington where Florida Gallinules had been seen by one of the other parties on the way down. The marsh was probably a couple of hundred yards in extent each way and was bordered on three sides by railroad embankments and on the other by the highway. It was full of water the surface being covered with duckweed (*Lemna*), with clumps of water arum (*Peltandra virginica*) thickets of cat-tails, and here and there a bar of soft mud. The Gallinules were seen swimming about or walking on the ooze, Least Bitterns arose frequently from the cat-tails and settled again, several Night Herons and one Green Heron were standing motionless, watching for prey. Suddenly Erskine spied another bird which he likened to a "Black Curlew," unwittingly using a name often bestowed upon this species, which Stone immediately

identified as a Glossy Ibis (*Plegadis falcinellus*). We studied it for half an hour or more from various angles with 8 × binoculars at a distance of 250 to 300 feet and could see the maroon chestnut of the neck and body and the greenish black wings while the decurved bill was always in evidence. The sky was overcast so that the colors did not show up as conspicuously as they would had the sun been shining, and sometimes the bird appeared entirely black.

It walked about slowly or stood still probing in the mud or pluming itself and once flew a few feet showing the black under surface of the wings. Mr. Henry Troth was with us and several members of the West Chester Bird Club, who had come to see the Gallinules, saw the Ibis but had not been able to identify it.

So far as we can ascertain this is the first record of the Glossy Ibis in this vicinity since one was killed on the marshes below Philadelphia by John Krider, in 1866.

After the above was written, we learned that two other parties had seen the bird, Messrs. Emlen and Hiatt being the first to discover it, and Mr. Baily's party coming upon it shortly after we had left. Their notes follow and they contain additional observations.—WITMER STONE AND RICHARD ERSKINE, *Academy of Natural Sciences, Philadelphia*.

Glossy Ibis in Delaware.—Late in the afternoon of May 30, 1927, a single Glossy Ibis was seen on an open marsh near Wilmington, Del. It was feeding in the shallow water gracefully probing the mire with its long down-curved bill and occasionally taking wing for a few feet as if some tasty titbit a little farther away had caught its eye.

After watching this unusual bird for fully half an hour it suddenly arose and flew away stretching its neck forward, slightly curved but not bunched up like a Heron's, and carrying its legs straight out behind.

The bird was picked out by Mr. N. J. McDonald and was identified by Mr. William Yoder both of whom together with Messrs. Philip A. Livingston and T. C. Benton accompanied me, as we were returning from an excursion to Milford, Del. Mr. Livingston adds that the Ibis in flight seemed to shear up on one side for several flaps of the wings and then on the other side, somewhat like a Woodcock. Mr. McDonald reports the bird back again on the afternoon of May 31.—WILLIAM L. BAILY, *Ardmore, Pa.*

Glossy Ibis at Wilmington Delaware.—On May 27, 1927 while exploring some marshes a short distance below Wilmington Del., we saw a bird about the size of a Green Heron wading about in the water. It was actively engaged in feeding and as it stalked about would thrust its long decurved bill into the soft mud bottom. After wading through mud and water up to our waists we got within twenty-five yards of the bird and had an excellent opportunity to study it at close range with the glasses and to convince ourselves that it was a Glossy Ibis. Its head and neck

were dark chestnut brown, the wings and back had a greenish lustre, the bill was similar in color to the back with the exception of the skin at the extreme base which was white. When it flew we noticed that it kept its neck stretched out making the curved bill very prominent.—BENJAMIN C. HIATT AND JOHN T. EMLIN, JR., *Germantown, Philadelphia*.

Glossy Ibises Reported Breeding in Louisiana.—Word has reached me, May 1927, of the discovery of a colony of these birds in southern Louisiana. J. A. Carruthers, employed by this Association to guard colonies of Spoonbills, Egrets and other Herons in southwestern Louisiana, has reported: "I just returned from about the center of Cameron Parish, a very isolated country, and I found a wonderful colony of Glossy Ibis, known here as the 'Beckroch.' There are at least 1,000 nesting now around a little lake known as Broussard Lake. I found some nests with four eggs, a greenish blue color. They build on the heavy rushes around this lake. It is a wonderful feeding ground as the tide overflow keeps plenty of food for the birds."—T. GILBERT PEARSON, 1974 Broadway, New York.

Black-crowned Night Herons in winter on Nantucket.—On Nov. 21, 1926, during a brief visit to Nantucket, a small party of Black-crowned Night Herons (*Nycticorax nycticorax*) was seen in a plantation of pine trees not far from the town. In Bent's 'Life Histories of North American Marsh Birds' (U. S. Nat. Mus. Bull. 135, p. 211) F. C. Lincoln gives winter records for this species at Boylston and Cambridge, Mass., but there is no mention of Nantucket. I was informed that the existing records concerning the avifauna of the island are all due to visits paid by ornithologists during the summer months.—W. B. ALEXANDER, *Croydon, England*.

Late Nesting of the Bobwhite.—I notice in the January number of 'The Auk' under *General Notes* the late nesting of the Bob-White (*Colinus virginianus virginianus*). On October 10, 1926 my wife and I were out to study birds and were very much surprised to see a large covey of young Bobwhites, perhaps twenty so small that some of them passed through the bolt holes in a railroad rail, as they were on the railroad. I have visited the place many times during the fall and winter in hopes of seeing them again but have failed to find them.—TONY DAVIS, *Marshall, Mo.*

Nesting of the Western Mourning Dove.—On September 4, 1926 in San Diego, Calif. I flushed a female *Zenaidura macroura marginella* from her nest in a *Rhus laurina* bush and discovered she had one young and one chipped egg. On September 8, the two young were found dead in the nest and the disappearance of the mother is easy to account for as the hunting season for Doves opened here September 1. On February 22, 1927, I was shown a pair of well feathered young Doves in a nest some fifteen feet high on a horizontal branch of a blackwood acacia tree. They were out of the nest by the 24th. This latter record, I believe, constitutes the first January breeding record for the state.—FRANK FORREST GANDER, P. O. Box 395, East San Diego, Calif.

Western Mourning Dove (*Zenaidura macroura marginella*) in Arkansas.—Ever since reading Mrs. Margaret M. Nice's most exhaustive and intensely interesting account of the nesting of the Western Mourning Dove at Norman, Oklahoma (Auk, Vol. 39, p. 457), I have been of the opinion that the Mourning Doves occurring in this locality might be referable to this sub-species, since Fayetteville is located only about 30 miles east of the Oklahoma line. Recently I submitted three males in breeding plumage, collected March 29, 31, and May 27, 1926, to Dr. Harry C. Oberholser of the Biological Survey for identification and he found them to be Western Mourning Doves. Heretofore all the Mourning Doves of the State have been considered to be the eastern form and it is possible that the Mourning Doves in the eastern part of the State are the eastern sub-species. Much work remains to be done in establishing the sub-specific status of many other birds occurring in the State.—ALBERT LANO, Fayetteville, Arkansas.

Turkey Vulture in Connecticut.—A male Turkey Vulture was sent to me in the flesh on May 14, 1927, which was shot the previous day at East River, Connecticut, a place about eighteen miles east of New Haven and four or five miles back from Long Island Sound. It was a bird about a year old, the ~~feathers~~ of the head having only a slight tinge of red. It had been feeding on some dead chickens. The occurrence of the Turkey Vulture in Connecticut is of sufficient rarity to make it worth while recording, and the skin was deposited in the Peabody Museum of Yale University where there is another skin of a Connecticut killed bird. (April 20, 1882, North Stonington.) The last record I know about is a bird killed in Danbury, May 19, 1902. There are 17 records prior to this one beginning in 1853.—HENRY H. TOWNSHEND, New Haven, Conn.

The Duck Hawk in Guiana.—The late H. Kirke Swann (A Synopsis of the Accipitres, Part IV) does not mention northern South America in the range of any of the American forms of the Peregrine Falcon, although evidence of the presence of the species in that region is not altogether wanting.

In 1922 I received from Surinam a Peregrine taken on April 19 of that year on the Kwatta road near Paramaribo, Dutch Guiana. The bird was identified by Mr. James L. Peters of the Museum of Comparative Zoology as belonging to the southern form, *Falco peregrinus cassini* Sharpe, supposed to be smaller and darker and to have more extensive black markings on the sides of the face than the northern bird, *Falco peregrinus anatum* Bonaparte. The specimen was in almost fully adult plumage, but with the under parts still streaked with black. Its wing measurement, 354 mm., would indicate that the bird was a female. Undoubtedly it was a migrant from the south.

Another example from Surinam is known. Among the birds sent by August Kappler to the Museum at Stuttgart we find listed *Falco peregrinus*

(Kappler, Holländisch Guiana, 1881, p. 164). Dr. Büchner, who examined the specimen informed me that the original identification was correct. He described the skin as that of a young male with yellowish under parts, streaked with black; wing 318 mm. This small wing measurement is suggestive of the subspecies *cassini* rather than *anatum*.

The only reference I know of the occurrence of the Peregrine in British Guiana is found in 'The Ibis,' 1862, p. 286, where mention was made of a collection of birds from British Guiana at an International Exhibition. Among the birds of prey there was an immature Duck Hawk. Commenting upon this specimen the editor said: "We observe in the same case an example of the American Peregrine (*Falco anatum*). If this is really a Guiana-killed specimen, it is the most southern locality for this bird hitherto recorded." In view of the fact that the species is now definitely known to occur in Dutch Guiana and in Trinidad (Cf. Hellmayr, Nov. Zool., 13, 1906, p. 46), there would seem to be no very good reason for doubting its presence in British Guiana. Whether the specimen at the International Exhibition was *anatum* or whether it was *cassini* is now open to question.

So far as I know, the species has not been recorded from French Guiana.—THOMAS E. PENARD, Arlington, Mass.

A Hawk Flight.—The article in 'The Auk' for January, 1927, entitled "An Autumn Hawk Flight" by H. S. and H. B. Forbes interested me very much as a very similar flight was seen here, at about 3 p. m. (standard time), on September 19, 1926, five days after the one mentioned above. The Hawks were at least thirty in number, and flew in the same manner as described in the aforementioned article, "swooping, turning and soaring." None flew very low but some were at a much greater altitude than others. Though I think they were Red-tailed Hawks I am not at all certain. Through 6 × binoculars the lower ones appeared to have a whitish breast, wide wings and a broad tail. They, however, kept sailing higher and higher, and soon all were out of sight. They were observed for about five minutes. The likeness in size of both these flights and the fact that they were seen here just five days later, leads me to believe that both accounts are of the same flight.—WILLIAM A. PAFF, 916 Pazinosa Ave., Easton, Pa.

Egg of the Sun Parrot.—When I returned from Surinam in 1921 I brought with me a young Sun Parrot, *Derophtus accipitrinus accipitrinus* (Linn.) which was said to have been taken from a nest hole in the spring of that year. On the morning of May 22, 1926 I found, to my surprise, that she had laid an egg. On June 28 she laid another, and on July 2 a third.

As the egg of this species is, I believe, undescribed the occurrence is not without some degree of scientific interest. Chubb (Birds of Br. Guiana, 1916, 1, p. 334), citing Schomburgk, states that the eggs of this species are

two in number. But Schomburgk, who has also been quoted on this subject by other writers, never saw the eggs. What he really said (Reisen Br. Guiana, 1848, 3, p. 726) was that the Sun Parrot laid more than two eggs, judging from four young birds of equal size, all taken from the same nest hole, which had been brought to him by an Indian.

The three eggs are dull white. The shell is fairly smooth and of medium thickness. The yolk is pale yellow. Measurements are as follows:

Date	Shape	Weight (grams)	Dimensions (millimeters)
1. May 22, 1926	Short ovate	12.01	33.3 × 26.8
2. June 28, 1926	Long ovate	12.48	37.3 × 24.7
3. July 2, 1926	Elliptical	12.95	37.4 × 26.0

THOMAS E. PENARD, Arlington, Mass.

The Virginia Nighthawk in the Bahamas.—While collecting on Hog Key, Bahamas, May 2, 1915, Mr. C. J. Maynard shot a Nighthawk that is, without doubt, referable to *Chordeiles minor minor* (Forst.) and not to *C. m. vicinus* Riley, the breeding Bahama form. The specimen, a female (M. C. Z. 68409) is a large bird, wing 191.5, agreeing in color with breeding birds from New England.

There are only two previous West Indian records of the Virginia Nighthawk that are wholly satisfactory, one from Spanishtown, Jamaica, listed by Oberholser, and another by Bangs and Zappey, of a bird (M. C. Z. 113249), taken by W. R. Zappey on the Isle of Pines, May 10, 1904. Other records believed to refer to the bird of northeastern North America are not well substantiated, and may equally well be referred to *Chordeiles minor gundlachii* Lawr.—JAMES L. PETERS, Museum of Comparative Zoology, Cambridge, Mass.

Nesting of Chuck-wills-widow in Kansas.—In April 1926, Mr. Orville Smock, R. F. D. 2, Arkansas City, Kansas, informed the writer that he had found Chuck-wills-widows nesting in a small wooded cañon, near Arkansas City, Cowley County, Kansas, in May 1923. A second set of eggs was found in the same woods in May 1924. These wooded hills are along the south valley line of the Arkansas River. This was interesting information, as heretofore no actual record had been made of the nesting of this bird in Kansas.

On April 25, 1926, I visited the spot and shortly after dark heard a Chuck-wills-widow calling in the wooded hills south of Mr. Smock's place. A little later another bird was heard calling in the low valley timber land west of the farm.

On May 2, 1926, about 10 a. m. we flushed two pairs in two different timbered ravines, on the rocky wooded hillsides. In the evening after twilight we heard more than a dozen calling from various patches of timber.

On May 9, 1926, in a small open park-like place in the timber on a

wooded hillside, I flushed a female Chuck-wills-widow from two fresh eggs. The eggs were laid on the bare leaves, being much exposed. The parent bird returned several times, uttering clucking notes. Photographs of the eggs were taken. Several other pairs of Chuck-wills-widows were discovered and flushed along the wooded hills, but although they showed evidence of being mated, only one pair was found nesting. I flushed a female from its single egg in rather dense timber.

For several weeks Chuck-wills-widows were heard calling in the stunted wooded sand ridges, in the low lying valley of the river. Visiting one of these wooded ridges Orville Smock flushed a female from two eggs lying on the leaves openly situated, but in the shade.

On May 19, 1926, we visited the wooded sand ridges again and two nests were found, one by Orville Smock, and one by Bert Brodock. Each nest contained two eggs. One set was very well marked with blotches of lilac grey to darker shades of umber brown, and were laid in an exposed situation on leaves. The other set lying on leaves at the bottom of a small swale, were rather well hidden. The first set was photographed. The eggs were fresh and the shells had a glossy lustre. The second set appeared to be very much incubated—and was not disturbed.

On May 31, 1926, I visited the last nest found May 19. It contained one downy young bird about a week old. The color of down was a red keel ochre. The coloring underneath was lighter, with a slight tinge of yellow ochre.

We visited a nest reported to us by a farmer living in the hills. It was in an exposed situation near the edge of the timber, and close to a wagon trail. The eggs in coloration were duplicates of the set found May 9. They were far advanced in incubation.

June 9, 1926, I heard several Chuck-wills-widows calling late in the evening, in Dixon's apple orchard, west of Arkansas City and north of the Arkansas River.—WALTER COLVIN, *Arkansas City, Kansas*.

The Rediscovery of *Myiarchus sclateri* Lawr.—Since F. A. Ober collected the type and only known specimen of a Flycatcher on Martinique, described by Lawrence (Proc. U. S. Nat. Mus. I, 1879, p. 357) as *Myiarchus sclateri* the species appears to have been lost, and no additional specimens secured until 1925, when during a visit to Martinique in the interests of the Museum of Comparative Zoology. I took two additional examples, both males.

My two specimens were collected near the village of Sainte Anne, about two miles from the southern extremity of Martinique. This is a region of low hills, mostly of limestone, none attaining an elevation of over 500 feet (estimated). Although the district is arid in character there is little cactus, but great stretches of acacia make an open thorn scrub, while on the higher and windward slopes there are larger trees forming a low dense forest. The first example taken on February 2, 1925, was sitting on a stub in a small clearing; the second, taken four days later, appeared suddenly from a

thicket whilst I was engaged in "squeaking up" a small mixed group of Passeres.

Description.—Entire top of head olive, mesial portion of the feathers darker, lores and orbital ring grayish, auriculars, sides and back of neck olive gray, back and rump olive; upper tail coverts olive brown with rusty edgings; tail blackish, four outer pairs of rectrices pale rufous on the outer edge of the inner webs (in one specimen; the same feathers but faintly tipped with rusty on the inner web in the other specimen). Primaries and secondaries blackish, inner primaries and outer secondaries with rusty external edges, inner secondaries with pale yellowish white outer borders; entire secondary series and inner primaries with pale rufous edges on the inner webs; wing coverts blackish, edges of greater and medium series with paler edges. Under wing coverts massicot yellow.

Anterior underparts gull gray becoming paler on the throat; posterior underparts citron yellow becoming paler (barium yellow) on the under tail coverts and more olive on the flanks; tibiae brownish olive.

Measurements. Wing 90, 91; tail 82, 86; bill from base 24, 24.5; tarsus 24, 24.

This little known Flycatcher, peculiar to Martinique, is a very distinct species, bearing little resemblance to any of the forms of *Myiarchus oberi* occurring on the neighboring islands to the north and south, being smaller, lacking the large rufous areas on the rectrices and in having a reduction of the amount and intensity of the rusty edging on the inner primaries and outer secondaries. In coloration *sclateri* is most nearly similar to *Myiarchus ferox ferox* (Gmelin) agreeing with that species in that the rufous tail markings are wanting or much reduced in size. It also bears a resemblance to *M. antillarum* (Bryant) in size and general proportions as well as color, but the abdomen of *sclateri* is yellow, not white as in *antillarum*.—JAMES L. PETERS, Museum of Comparative Zoology, Cambridge, Mass.

The Snow Bunting (*Plectrophenax n. nivalis*) in Georgia.—I am indebted to Mrs. J. L. Dodge for the privilege of recording three Snow Buntings that she saw and positively identified at Georgetown, Columbia Co., on January 28, 1927. When first seen Mrs. Dodge mistook the birds for albinos but upon looking at them through glasses she saw that they were of the above species and wrote to me at once respecting her discovery.

There is a Georgia record for the Snow Bunting in Mr. Ridgway's 'Birds of North and Middle America' (Part I, 1901, p. 149) in the range, but the locality is not mentioned by him in the citation.—ARTHUR T. WAYNE, Mount Pleasant, S. C.

Breeding Range of Macgillivray's Seaside Sparrow (?) in S. C.—In 'The Auk' for April, 1927, vol. XLIV, page 254, Mr. Arthur T. Wayne expresses the opinion that the Sparrows which the writer found breeding for the first time in South Carolina in 1924, and which have been referred to since under the name of *Passerherbulus maritimus macgillivrayi*, are not of that subspecies.

Until Mr. Wayne thoroughly examined specimens taken, and compared them with specimens of *P. m. macgillivraii*, the writer considered them to be true representatives of that form. In his article, Mr. Wayne does not venture an opinion as to what these Sparrows really are, all of his assertions being in the negative. Until the matter is settled therefore, I will continue to refer to them, as has been done in the several articles which I have written on them.

Since the last breeding season, another interesting fact has come to light with regard to the enlargement of the breeding area. In the past all nests of these birds have been found in one locality, a wide marshy tract, about 15 miles to the southwest of Charleston, S. C., near the settlement of Rantowles. In the past three years repeated searches in likely looking spots have failed to reveal any more breeding places, a fact which is, in itself, strange.

On May 12 last, Mr. E. B. Chamberlain, who was with the writer when the first nests were discovered, saw numbers of the Sparrows in a tract of marsh about 15 miles to the north of Charleston, and, on May 18, he and the writer, together with three small boys, made a trip to the spot to look for nests. In less than fifteen minutes, the writer flushed one of the Sparrows from a nest with three eggs, and, due to the indefatigable efforts of the youngsters, four more were discovered during the afternoon, thus establishing a thriving colony, as these birds go.

This habit of community nesting is certainly a marked characteristic of this form. They seem to delight in each others company, and build their nests in close proximity, although careful search is required to find them. This last colony had their nests within an area of 100 yards square, four nests being within 50 yards, although the marsh itself covered some miles. Unlike the Rantowles colony, which built in rather tall spartina grass, these Sparrows were found in a very short growth of bright green, soft velvety grass about six inches in height. All of the nests were within an inch or so of the ground, and again differed markedly from the Rantowles nests, in being arched over the top with the living grass, making discovery doubly difficult. This characteristic was not noticed in a single nest discovered at the former breeding ground. The behavior of the birds was similar to those already studied. No special alarm was noted, the owners simply sitting about on the nearby grass stems, uttering the strange, buzzing song continually.

This colony, then, discovered at least fifteen miles from the first, enlarges the known breeding range on the South Carolina coast to that extent, at any rate, a fact which three years study had failed to reveal.—ALEXANDER SPRUNT, JR., *Charleston Museum, Charleston, S. C.*

***Streptoprocne semicollaris* (De Saussure) in Chihuahua.**—The White-naped Swift appears to be one of the rarest and least known of American birds, hitherto only recorded from south-central Mexico. Among the birds sent to Mr. William Brewster from Chihuahua by R. R.

McLeod about forty years ago is a specimen of this species taken at Jesus Maria, June 5 (year?). In McLeod's writing on the original label is the notation "brought to me by a boy who killed it with a stone, have not seen another like this."

So far as I am aware this specimen has never been recorded. It is now No. 224, 263 in the collection of the Museum of Comparative Zoology.—JAMES L. PETERS, *Museum of Comparative Zoology, Cambridge, Mass.*

Prothonotary Warbler Breeding in Chatham Co., Georgia.—

While in a boat on the Ogeechee River near the western border of Chatham Co., Ga., on May 14, 1927, I saw a male Prothonotary Warbler in a clump of willows overhanging the stream.

At some distance lower down a female was seen. She flew into an old shattered post standing in the stream. Suspecting a nest we approached. She flew out of the post and into a willow near by. Looking into the top of the post we saw the nest containing five eggs. We left eggs and nest just as we found them.

I understand from local oölogists that this is the first record of the Prothonotary Warbler's nest and eggs being found in Chatham Co.—MRS. V. H. BASSETT, 1010 E. Park Ave., Savannah, Ga.

The Yellow Warbler (*Dendroica aestiva aestiva*) in Dutch

Guiana.—On August 28, 1921, while watching the operations of some bird-catchers at Krepie (Charlesburg), near Paramaribo, Dutch Guiana, a Yellow Warbler came to the tree in which one of the trap cages was hung. It paid no attention to the calls of the Euphonia (*Tanagra violacea violacea*) which was employed as a decoy, and, of course, showed no interest in the banana which was used for bait. Luckily it also avoided the birdlime which had been set at several points in the same tree. The bird moved silently and leisurely, working its way in the trees along the ditch at the side of the road, keeping well up among the branches. I followed it along the road for several hundred yards, but heard not a sound from it.

On September 3, I saw another in the low mangroves at Leonsberg, east of Paramaribo. Foraging for food the bird moved quietly from branch to branch, and in its course stopped to inspect an old nest which I took to be a Todirostrum's, presumably for insects. After that I saw several more, always singly, in and about the city. On September 27, I observed one at Braampunt at the mouth of the Surinam river. It seemed to me that this bird was exceptionally quiet, contrasting sharply with a little Blue-gray Sugar-bird (*Dacnis plumbea*) in the same tree, whose song sounded not unlike that of a Yellow Warbler but was of longer duration.

As I had not seen any Yellow Warblers in July or in August up to the date mentioned, I assume that the birds observed by me were migrants from the north. If so, August 28 is, I believe, the earliest date yet noted for the fall arrival of this species in Surinam. And if, as is supposed, the Yellow Warbler reaches Guiana via Central America, and not by the way

of the West Indies, this bird must have passed through Colombia several days before. I mention this because the earliest date I have been able to find for the fall arrival of this species in northern South America is of a bird secured by one of Mr. H. H. Smith's collectors August 27, at Bonda, Colombia, reported by J. A. Allen (Bull. Am. Mus. Nat. Hist., XIII, 1900, p. 177).

F. P. and A. P. Penard (Vogels van Guiana, 1910, 2, p. 483) give the following dates of arrival at Paramaribo for six consecutive years: September 10, 6, 7, 17, 16, and 3, when the birds appeared to be more abundant, decreasing gradually in numbers after these dates, and increasing again towards February. They state further that a few individuals remain through the summer, but that these residents probably do not breed, because specimens, taken in May, June, and July, gave no evidence of breeding.

Yellow Warblers are known in Dutch Guiana as "Kopro-foroe" (Copper-birds). They are extremely shy in this part of the tropics. In the city they keep to the higher trees, but at the coast and along the rivers they are frequently seen in the low mangroves.

The only sound I have heard from them is a soft chip. I have never heard the song in Surinam.—THOMAS E. PENARD, *Arlington, Mass.*

Connecticut Warbler at Atlanta, Ga., in Spring.—On May 8, 1927, I added to my list of Atlanta birds the name of the Connecticut Warbler, *Oporornis agilis*. This bird was positively identified by me in a swampy section bordering Sullivans Creek, a small tributary of the Chattahoochee River, about 16 miles north of the city. It was in some small bushes on the edge of the Creek and as I was only about fifteen feet from it and using strong field glasses I was able to see and take note of all the main characteristics especially the white ring around the eye, which was very conspicuous, gray throat, upper breast and head.

In 'Birds of Alabama' Mr. Arthur Howell mentions this bird in fine print stating that "it should be found at that season (spring) in Alabama" and also states that "it has been observed several times in May at Chattanooga, Tenn."

Another author states that it is "excessively rare east of the Alleghanies in spring."

I do not find a single specimen of it in the State Museum in our Capitol Building here but there is one specimen in the Emory University Collection, a male bird taken by D. V. Hembree of Roswell, Ga. May 10, 1922.—EARLE R. GREENE, *Manor Ridge Drive, Atlanta, Ga.*

Chickadee and Polyphemus Cocoon.—While riding through a wooded canyon on the reservation one day in December, 1926, a Chickadee was seen to emerge from a clump of oak trees and fly laboriously across an open area with some large object dangling from its beak. It flew low to the ground and was experiencing considerable difficulty in its

progress. A short pursuit caused the little feathered mite to drop its treasure and take refuge in unhampered flight. The object proved to be the cocoon of a polyphemus moth (*Teia polyphemus*) with an enclosed viable pupa. The cocoon was as large as the body of the Chickadee and contained enough rations for several good meals. Apparently the little fellow was about to enjoy a feast that Lucullus himself might have envied. L. L. GARDNER, Fort Riley, Kansas.

Hudsonian Chickadee in Michigan and Wisconsin.—On July 12, 1926, Mr. B. Twombly and I observed a flock of about ten Hudsonian Chickadees in a spruce-tamarack swamp in Gogebic County, Michigan, near the shore of Mamie Lake. Two of the birds were collected, one adult and one young. They were first seen at the top of a dead spruce among some vines. Their notes "chee-dee-dee" uttered much slower than the note of the Black-capped Chickadee, combined with their smaller size, which I could even recognize at a distance of thirty feet, identified them. The two collected were in excellent plumage, the adult having the darker brown cap.

These birds were collected practically on the State line between Gogebic County, Michigan, and Vilas County, Wisconsin. Either State may easily claim the record.

In looking up previous records for the Hudsonian Chickadee, I find that Norman A. Wood found some in a similar swamp many years ago in Michigan; but as far as I know there are no summer records for Wisconsin, even the winter records being few and questionable.—CHARLES D. KLOTZ, Winnetka, Illinois.

Rare Birds in North Carolina.—An immature hybrid between a Brant and a Snow Goose was killed from the Duck Island Club, Wanchese, N. C., on December 21, 1926, by Mr. Albert Daniels, the club superintendent, and by him sent to the Museum in the flesh. On request for particulars regarding the capture, Mr. Daniels writes as follows: "This bird was alone when I shot it and was flying swift over the decoys. This is the first one I have ever seen, but on December 28 I did see a flock of five of the same kind of birds and have been informed of one other flock being seen on Christmas Day." The feet and legs of this bird were of a greenish gray color. It was quite poor in flesh, its weight when received being three pounds six ounces. I took it for an immature Barnacle Goose until the identification was made by Dr. H. C. Oberholser.

Is it possible, or likely, that this specimen, together with the other five mentioned by Mr. Daniels, constituted a hybrid brood?

On December 27, 1926, a Dovekie (*Alle alle*) in the flesh was received by the Museum from the eastern part of Core Sound, near the small town of Atlantic. The specimen was in poor condition.

An immature specimen of the Razor-billed Auk (*Alco torda*) was received in the flesh on January 19, 1927, the bird having been taken on the

previous day in the southwest corner of Pamlico Sound between Portsmouth and Harbor Island and within twelve or fifteen miles of the place where the before-mentioned Dovekie was taken. The specimen was in good physical condition, very fat in fact, weighing one pound six ounces. I am only familiar with four previous records of the Razor-bill in North Carolina.—H. H. BRIMLEY, *State Museum, Raleigh, N. C.*

Supplementary Records for Upper South Carolina.—South Carolina is the only Atlantic State from Maryland to Florida that sends no water into the Gulf of Mexico, its most northern boundary, however, follows the dividing ridge for a number of miles. Since Georgia and North Carolina are contiguous for quite a distance, I have found the avifauna of the triangular space representing the piedmont and alpine region of South Carolina interesting in the determination of the southeastward distribution of certain forms. The notation "from Virginia (or elsewhere) to Georgia," may not include this State. Loomis worked the lower piedmont and alpine regions very thoroughly in the period from the late '70's to the early '90's. Since that time the development of a number of large hydro-electric dams has probably rendered more common some of the water-birds in the region above the fall-line. The following forms have not, I believe, been previously recorded in 'The Auk' for this section.

Larus argentatus, HERRING GULL. Occasional on larger bodies of water.

Chlidonias nigra surinamensis, BLACK TERN. For the material evidence for this and the preceding form, I am indebted to Dr. D. T. Smith, now of New York, but formerly of Greenville. The specimens were taken near Greenville.

Mycteria americana, WOOD IBIS. This form I have seen above Columbia on the Broad river.

Botaurus lentiginosus, BITTERN. This specimen, also taken in the vicinity of Greenville, I found in the D. T. Smith collection.

Rallus elegans, KING RAIL. Two nests found by Mr. William Hahn, Jr. near Greenwood, one on May 14, 1924, another, May 2, 1926.

Buteo platypterus, BROAD-WINGED HAWK. Mr. Hahn found one nest near Greenwood, April 21, 1926; the eggs were half-incubated.

Aquila chrysaetos, GOLDEN EAGLE. Occasionally occurs in this vicinity. One was shot in this county in the spring of 1926 and brought in to the city. This is the last record in my possession.

Colaptes auratus luteus, NORTHERN FLICKER. This form occurs locally, as I determined from measurements of a specimen secured by students during the winter of 1924-5, which I have added to a local collection in the care of Prof. G. A. Buist. In answer to a letter of enquiry, Dr. Thomas Smyth of the University of South Carolina, Columbia, reports that the same sub-specific form has been obtained there, on January 25, 1926. To the same authority I owe thanks for material evidence of the next form, taken at Lakeview.

Dryobates borealis, RED-COCKADED WOODPECKER. This coastal plain form occurs in the very edge of the piedmont.

Corvus ossifragus. FISH CROW. Somewhat rare. Occurs in the lower piedmont. Mr. Wm. Hahn, Jr. found a nest on Rocky Creek near Greenwood, April 1, 1925.

Passerina ciris, PAINTED BUNTING. No specimen taken, but a single bird on Broad River above Columbia I observed carefully with a high-powered binocular, May 21, 1923.

Protonotaria citrea, PROTHONOTARY WARBLER. Occasional in the lower piedmont below the five-hundred foot level. No specimens. I have a personal record of one observed near Troy, S. C., about ten years ago. Mr. P. M. Jenness reports it from the Catawba river near Great Falls in a letter of May 24, 1926.

Compsothlypis americana usneae, NORTHERN PARULA WARBLER. This appears to intergrade in this vicinity with *C. a. americana*, a specimen I got in upper Anderson county I refer to *americana*, but I have observed what is apparently the other form. The specimen of *americana* attributed by Chapman to "Caesar's Head in the mountains of western North Carolina," was probably taken from Caesar's Head in this county, that point being very near the state boundary. (Warblers of North America, p. 103). This, and the two preceding are of course hypothetical. Curiously enough many biological forms found both on the coastal plain and in the mountains I have not found in the intermediate piedmont, and while the Parula breeds along the coast, and in the mountains, between these regions it appears chiefly, or entirely as a migrant.—A. L. PICKENS, Greenville, S. C.

Effect of An Early Spring on the Resident Breeding Birds of Athens, Clarke Co., Georgia.—Through the middle of January the weather this past winter, 1926-27, was quite normal, and devoid of any incidents worthy of comment. January 16 witnessed the lowest temperature so far experienced for it hovered between 14° and 18° F. that day, and for the first time in a year or more the few lakes and ponds about Athens were completely frozen over. The following day there was a marked moderation in the weather and there followed five weeks, clear and warm, with practically no rainfall, and conditions that rarely are experienced before the middle of February. At the end of January the Weather Bureau reported but 1.11 inches of rain, the lowest on record for that month, while on January 21 the thermometer registered 76° F., with days both preceding and following almost as warm. Vegetation responded at once to this incentive to growth, and by the latter part of February the appearance of the scattered stretches of woods about Athens was typically that of late March. On the 18th of February the weather changed again and for the following three weeks there were days when it was rather cold, with frequent rains and high winds, and, on March 2nd, an inch of snow, the first that had fallen here in three years. During this long stretch of

abnormally warm weather I had wondered what effect it would have on the resident breeding birds of this part of Georgia, and its apparent and unquestioned influence, in spite of the setback later received, was of decided interest. I unfortunately lacked the time I would otherwise have devoted to a systematic search for nests of the species listed below but the records will give an idea of how an early spring will affect bird life in any locality.

Dryobates pubescens pubescens. SOUTHERN DOWNY WOODPECKER.—This species usually has fresh eggs from the middle of April through the first of May, my earliest breeding record until this past spring being a nest found April 15, 1923, with four fresh eggs. On April 5, 1927, a female was flushed from a nest in a rotten willow stub that held four eggs showing slight incubation.

Spizella pusilla pusilla. FIELD SPARROW.—This species rarely breeds here before the middle of April, and while I have found numerous nests the latter part of that month with fresh eggs, my earliest breeding record until this year was a nest that on April 18, 1922, held four slightly incubated eggs. On April 7, 1927, a nest was found with four fresh eggs, built, as is usual with this species, at the edge of a field overgrown with scrubby underbrush.

Richmondia cardinalis cardinalis. CARDINAL.—I had never before known this species to begin breeding in March, so it was of decided interest to me to find a nest April 6, 1927, that held three young already several days old. Considering twelve days for incubation this nest must have held a full set of three eggs by approximately the 23rd of March. This is almost three weeks earlier than my previous earliest record, a nest found April 9, 1922, with three fresh eggs.

Lanius ludovicianus ludovicianus. LOGGERHEAD SHRIKE.—This species normally has fresh eggs by the first of April so a nest found March 27, 1927, with five slightly incubated eggs was by no means unexpected. However, it offered an interesting comparison with the spring of 1926 when all of March was unusually cold and this same pair of birds, which nest each year in a small grove of pines, were not incubating their full set of five eggs until April 18.

Dendroica pinus. PINE WARBLER.—This species is one of the earliest of the birds to breed here, but it was nevertheless somewhat of a surprise to find a nest already well started on February 17, 1927. Had the weather continued good I have no doubt but that it would have held eggs by the first of March; however the birds were not discouraged even by the inch of snow that covered the ground on the morning of March 2, and on March 15 this nest held four fresh eggs. Normally this species breeds the latter part of March, my earliest record until this past spring being a nest found March 25, 1921, with four slightly incubated eggs.

Mimus polyglottos polyglottos. MOCKINGBIRD.—As with the Cardinal I had never before known this species to breed in March so I was quite interested to find a nest April 13, 1927, that held well-grown young. Other

years it has been the middle of April or later before many of the birds were nesting, my earliest record until this past spring being a nest found April 13, 1921, with four fresh eggs. The nest found this year unquestionably held a full set of fresh eggs by at least the 27th of March, over two weeks earlier than this species usually breeds.

Sialia sialis sialis. BLUEBIRD.—This species rarely nests before the first week in April, and until this past spring my earliest breeding record was a nest found March 22, 1925, with four fresh eggs. On March 17, 1927, I found a nest that held three slightly incubated eggs, an early and rather small set considering that it was the first brood of the year.—THOS. D. BURLEIGH, Athens, Clarke Co., Georgia.

Notes from the Chicago Area.—*Stercorarius parasiticus*. PARASTIC JAEGER.—On October 29, 1926, and on the days immediately before and after, this northern visitor seems to have been almost numerous over the lagoons along the lake shore near the Field Museum. Mr. E. G. Wright of the Harris Extension Branch of the Museum took three on the date indicated above. They are all in the immature plumage.

Larus marinus. BLACK-BACKED GULL.—On September 26, 1925, while walking along the lake shore at Wickliffe, near Mineral Springs, Porter County, Indiana, I noticed a number of Gulls in the distance. They were standing close together, as if in convention assembled, within a few feet or yards of the lake. Creeping up to the place behind the first incipient dune, I was almost startled when, getting my glasses on them—which, indeed, was hardly necessary—I saw three enormous Gulls before me, much larger than the Herring and Ring-billed Gulls all about them. They were in the immature plumage, the black terminal tail-band, the frosted appearance of the breast, but mainly their size marking them plainly as belonging to this species. There had been strong equinoctial gales on the previous days, which had probably brought them along from farther northeast. They have been reported from this part before.

Oidemia americana. AMERICAN SCOTER.—On October 23, 1926, my son E. G. Eifrig was staying at Grand Tower, near Murphysboro, on the banks of the Mississippi, in connection with the building of the huge power house there. Noticing multitudes of Ducks on the big river, he went out for a short hunt. Among his bag of Scaups, Ruddies, Pintails and Buffle-heads, which he brought home, I was much surprised to find three young American Scoters. Woodruff, in his 'Birds of the Chicago Area,' gives no definite records of this species for Illinois, neither does Bent in his admirable 'Life Histories,' both stating that it occasionally winters on the Great Lakes.

Chen hyperborea subspecies? SNOW GOOSE.—It is being reported much oftener of late by sportsmen and other observers than formerly. One shot November 25, 1925, on Lake Griswold was brought in to Kahmann's taxidermy shop, but I did not see it before it was taken away by its owner, so the subspecies could not be determined. One in my collection, taken

in the same general region as the one referred to, is *Chen h. hyperborea*, which is the one to be expected in our area.

Grus mexicana. SANDHILL CRANE.—Seen and reported more often of late than formerly, by observers who are competent to differentiate between the Great Blue Heron and this species. They have been seen in the Indiana Sand Dunes, at Cary, on the Fox River, and at Hinsdale. The last was observed by Dr. A. Lewy, May 20, 1923. They are either becoming more numerous again, or there are more observers than formerly.

Ionornis martinica. PURPLE GALLINULE.—On September 22, 1925, a former pupil brought me a bird which he had picked up dead in Bellewood, a suburb of the big metropolis, three or four miles from River Forest. To my astonishment it proved to be a young *Ionornis martinica*. It would seem difficult to explain its presence here at this time, unless the Purple Gallinule joins in the northward pleasure jaunts indulged in by certain of the southern Herons.

Sturnus vulgaris. STARLING.—On October 11, 1926, I saw a Starling among about a hundred Cowbirds and Grackles in a large cottonwood tree in the forest preserve along the Desplaines River in River Forest. I watched it for five or ten minutes through my Zeiss 8 power binoculars, noting every detail, till a low-flying aeroplane made the birds take wing. About two weeks later I saw one in Kahmann's taxidermy establishment that had been shot or found dead at Joliet, Illinois, 40 miles southwest of here. The last-named seems to be the first specimen secured in Illinois.—C. W. G. EIFFRIG, *Concordia Teachers College, River Forest, Ill.*

Three Records for Colorado.—*Gavia stellata*.—RED-THROATED LOON.—In an amateur collection of birds, mounted at Cripple Creek and donated to Colorado College, is an immature Loon of this species, said to have been killed at Antero Reservoir in the west side of South Park.

Buteo platypterus. BROAD-WINGED HAWK.—On or about May 15, 1826, Mr. J. H. Weymer shot one at Seven Falls to prevent its catching his tame chipmunks. It is a female in young of the year plumage.

Bubo virginianus. GREAT HORNED OWL.—A Horned Owl of the eastern form was caught in the mountains near Colorado Springs November 24, 1926, in a steel trap that had been set for a wild cat. It is a typical adult female.

These are now in the mounted bird collection of Colorado College Museum.—CHARLES EDWARD HOWARD AIKEN, *Colorado Springs, Colorado.*

Denver Birds.—A complete list, published in 'The Wilson Bulletin,' September 1917, giving all the birds recorded as having been seen or collected within the corporate limits of Denver, Colorado, totalled one hundred and eighty-seven species and subspecies.

A supplement to this list published four years later (Wilson Bulletin June 1921) added twelve more birds to the total, making at that time 199 species and subspecies of Denver birds. Since that supplement appeared the following birds have been seen or taken within the present legal limits of Denver, all by the present writer, unless otherwise specified:—

Larus franklini. FRANKLIN'S GULL.—Many seen flying over the city and some in the larger lakes of the parks of the city, from September 5, to 22, 1926.

Querquedula cyanoptera. CINNAMON TEAL.—One was noted in the larger lake of City Park for several days during the summer of 1910 by Dr. S. B. Childs of Denver, an experienced and well informed collector of water birds.

Aquila chrysaetos. GOLDEN EAGLE.—One seen flying high over Cheesman Park April 25, 1922.

Bubo virginianus pallescens, subsp? GREAT HORNED OWL.—One captured by a citizen in North Denver February 12, 1927 (well pictured in the Denver Post of that date).

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER.—One in Cheesman Park October 8, 1921.

Sphyrapicus thyroideus. WILLIAMSON'S SAPSUCKER.—One in Cheesman Park April 15, 1923.

Pipilo maculatus montanus. SPURRED TOWHEE.—One in Cheesman Park May 14, 1922.

Spiza americana. DICKCISEL.—One seen at the eastern edge of the city near Sixth Avenue, July 30, 1926.

Vermivora celata lutescens. LUTESCENT WARBLER.—One in Cheesman Park, May 22, 1921.

Dendroica striata. BLACKPOLL WARBLER.—One in Cheesman Park May 24, 1924.

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.—One in Cheesman Park, December 25, 1925.

The above eleven records, when added to the original and supplemental lists, make a total of two hundred and ten species and subspecies which have been recorded definitely as having been taken or seen in the area covered by present day Denver.—W. H. BERGTOLD, *Denver, Colorado*.

An Avian Parasite.—Bird parasites are probably more common than we realize, but rarely are they detectable in the field by an observer. The peculiar appearance and actions of a Hermit Thrush (*Hylocichla guttata pallasi*) in Rittenhouse Square, Philadelphia, October 7, 1926, attracted my attention. The abnormal tameness of the bird surprised me, for I was able to approach within six feet of it on the open lawn. This, I discovered, was due to the fact that the bird had lost the sight of the left eye (the lids being tightly closed) and I had approached it from the blind side. A pinkish colored worm, fully two inches long and about one eighth of an inch in diameter hung from the Thrush's partly open mouth, but the bird stood motionless for fully a minute, making no effort to swallow it. Presently the worm was seen to wriggle, at which the bird appeared to make an effort to swallow it, but met with little or no success. The worm then wriggled from the bird's mouth, but instead of dropping to the ground, the free end hung down, while the other end was hidden from

view among the breast feathers near the bend of the left wing. I realized, then, that this was no earth worm, but a parasite of some sort that had worked its way out through the skin. As I watched, the free end of the worm wriggled upwards, secreting itself beneath the feathers of the upper, left breast, but through a gap in the feathers it could still be seen coiled about itself when observed at close range. A few minutes later the parasite again broke loose, and the Thrush pecked viciously at it until it took refuge beneath the feathers as before. In this position the worm was too close to the bird's throat to be reached by the beak.

Mr. Julian K. Potter, later in the day, observed the Thrush at close range and through the gap in the feathers could plainly see the parasite coiled about itself.

The following day the Thrush was not to be found, having evidently joined its brother migrants, and taking along the tormentor which may have been responsible for the loss of the eye, and which, ultimately, would cause the bird's death.—JOHN A. GILLESPIE, *Glenolden, Pa.*

RECENT LITERATURE

Mathews's 'The Birds of Australia'—With the publication on February 8, 1927, of Part 10 of Volume XII, this great work is at last completed. Ever since the present editor took over 'The Auk' in 1912 the 'Birds of Australia' has been coming in regularly for review and in almost every one of the quarterly issues of the journal there has been a notice of Mr. Mathews's work. The first part appeared on October 31, 1910 and it with the three succeeding parts were reviewed by Dr. J. A. Allen before he retired from the editorial chair. While we shall miss the regular appearance of these handsome quartos on our desk, we heartily congratulate Mr. Mathews upon the completion of his gigantic undertaking, and his publishers, Messrs. H. F. and G. Witherby, upon the fine piece of printing which they have turned out. We must also recognize the indefatigable energy with which Mr. Mathews has delved into every part of his subject, while systematic ornithologists of all time will owe him a debt of gratitude for the vast amount of bibliographic and nomenclatural data that he has made available.

The production of the main work has involved several other publications. Mr. Mathews has prepared several lists of Australian birds, and has published the first volume of a 'Manual' of the birds of the country besides establishing a journal, the 'Austral Avian Record', for the early publication of new names and of papers dealing with nomenclatural and bibliographic subjects. As joint author of the manual and as collaborator in much of his research work he has had the assistance of Mr. Tom Iredale for some years his private secretary. From the start of his study of the Australian birds Mr. Mathews was impressed by the nomenclatural complications which have hampered systematic work and his effort has ever been to clear these away, to get to the bottom of all the problems, and settle them for all time. He has gone to much expense and trouble to run down all publications which might affect the nomenclature of Australian birds and to solve questions of dates of publication and other matters which previous authors had left in abeyance or had been unable to settle. Naturally he discovered facts which seriously affected the nomenclature of the birds of other countries, even those of England and America, and upon publishing these and calling attention to the necessary changes of names he aroused much opposition from the conservative element and soon constituted himself a sort of stormy petrel of ornithological nomenclature.

We have always had great respect for his sincerity of purpose and for the great service that he has done to ornithology in bringing to light so many overlooked publications and in settling so many problems depending on dates of publication. We have endorsed his researches in nomenclature and have agreed to most of his findings. His main effort has been to arouse Australian ornithologists to a realization that Gould had not said the last

word on the birds of the Antipodes and that they could not sit back and ignore the rest of the world and all early authors, but must move along with the rest of us and bring their nomenclature up to date. The old school conservatives would have none of this and bitterly opposed Mr. Mathews's ideas but with the passing of the years the younger men have in a great measure come into agreement with him and, thanks to his efforts, the latest check-list of the Australians follows the same code of nomenclature that governs the rest of the scientific world.

A visit by the author to Australia in 1914 did much to smooth out many differences of opinion and a stop over in Philadelphia on his way back to England gave us the pleasure of his personal acquaintance and the opportunity to show him the famous Gould collection in the Philadelphia Academy.

In the matter of subspecies Mr. Mathews was an extremist and proposed them at a rate unequalled we believe by any other writer, and here again he encountered quite as much opposition from the older Australians as in his revision of names. We considered that in the main he was doing good work here, as in the nomenclatural field, though it seemed at times, especially in view of his frequent cancellation of many of his own new forms, that he was sometimes hasty in setting up names to be immediately knocked down, without waiting for adequate data and without considering the trouble he was creating for those who had to catalogue these names and look them up whenever they were engaged in working out allied forms. Then too, as we have several times said, there was often no mention of a type specimen.

It is interesting in view of Mr. Mathews's many discussions of nomenclature to see how his attitude on certain points changed as his work progressed. In the opening volume he congratulates the authorities of the British Museum upon their intention of ignoring many of the "useless generic names" of the late Dr. Bowdler Sharpe and yet in a few years we see Mr. Mathews as one of the most extreme genus splitters that ornithology has known. So again in spite of his vigorous plea for the universal use of subspecies we find him, by the time Vol. V is reached, refusing to give them the full recognition in the text that they had previously received and simply discussing them at the end of each species. And what is far worse placing them in the synonymy where they cannot be distinguished from the real synonyms. The number and treatment of subspecies however are ornithological problems, always subject to personal opinion, with no possible "code" to govern them.

We have felt that the great amount of space devoted to nomenclatural discussion in the 'Birds of Australia' was unfortunate as most of the facts could usually have been stated without nearly so much verbiage and often the very fact that the author was endeavoring to bring out has been obscured by useless repetition. It seems as if some parts of the text may have been printed from a hastily prepared manuscript without revision. We have discussed Mr. Mathews's great work from a nomenclatural

point of view because that seems to have been the author's chief concern in its production and that is the feature that will be remembered in the future. He has, however, collected a great deal of valuable and interesting data on the lives and habits of the birds but as he tells us the adequate life histories of the Australian birds are yet to be written and his aim has been to clear away the technical difficulties in Australian ornithology and set up the species and their names on a permanent basis. This we feel that he has done or at least has presented all of the necessary information on the subject, an achievement of which he may well be proud.

The plates are of varied artistic merit but all give a good representation of the species so far as purposes of identification go. It is impossible to compare the work of the artists concerned with that of Fuertes, Thorburn or Brooks because they were drawing birds that they had not had the opportunity of studying in life. As artistic productions too they cannot be compared with the great folios of John Gould.

Five artists were engaged on the present work. The greater part of the plates of the early volumes are by Keulemans and are probably the best. He contributed 56 to Vol. I, 44 to Vol. II, 62 to Vol. III and one to Vol. IV. Goodchild prepared 3 for Vol. IV, one for Vol. V, and 11 for Vol. VI, while Roland Green contributed most of the Parrot plates, and some of the groups that followed: 38 to Vol. VI and 23 to Vol. VII; while there is one plate, that of the Black-cheeked Falcon, by G. E. Lodge. The greater part of the plates however are from drawings by Grönvold who contributed to every volume furnishing 360 plates or more than half of the total.

The edition was, we are informed, finally limited to 225 copies (of which the one before us is 202) so that it will not be a common book in libraries.

As many supplements, appendices, errata and disconnected notes have appeared in the various parts of the work and as the exact contents of the various parts and their dates of publication appear only on the covers, it seems worth while at this time to present some of this information where it will always be available.

Volume I. Casuariiformes, Galliformes, Turniciformes, Columbiformes, Ralliformes, Podicipediformes, Sphenisciformes.

Part I. October 31, 1910. pp. 1-96, pls. 1-19.

Part II. January 31, 1911. pp. 97-136, pls. 20-33.

Part III. April 29, 1911. pp. 137-184, pls. 34-45.

Part IV. August 9, 1911. pp. 185-234, pls. 46-58.

Part V. October 31, 1911. pp. 235-286, pls. 59-67.

Part VI. January 31, 1912. pp. 287-301 + i-xiv.

An extralimital genus *Mantellornis* is discussed at p. 255 and several extralimital species, *Geopelia shortridgei* (p. 138), *Porphyrio albus* (p. 247) and *Eudiptula minor iredalei* (p. 286). *Lopholaimus antarcticus minor*, not numbered, is inserted on p. 122. Pp. 183-184 in Part III are cancelled and reprinted in Part IV. There is a list of errata on p. xiv.

Volume II. Procellariiformes and Lariformes.

Part I. May 30, 1912. pp. 1-120, pls. 68-81.

Part II. July 31, 1912. pp. 121-236, pls. 82-94.

Part III. September 20, 1912. pp. 237-356, pls. 95-107.

Part IV. November 1, 1912. pp. 357-476, pls. 108-120.

Part V. January 31, 1913. pp. 477-527 + i-xiv, pls. 121-124.

An extralimital genus is discussed, pp. 174-177, *Pagodroma*, and an extralimital species *Pterodroma mollis* (p. 157). There is an erratum on p. xiv.

Volume III. Charadriiformes, Psophiiformes and Ardeiformes.

Part I. April 2, 1913. pp. 1-104, pls. 125-137.

Part II. May 2, 1913. pp. 105-204, pls. 138-150.

Part III. August 18, 1913. pp. 205-300, pls. 151-166.

Part IV. December 31, 1913. pp. 301-380, pls. 167-177.

Part V. March 26, 1914. pp. 381-444, pls. 178-189.

Part VI. January 25, 1914. pp. 445-512, pls. 190-199, + i-xvii.

Between the genus *Dieltmatias* and the species *D. hardwickii* are interpolated on 283-295, some remarks on the Snipes and Woodcocks and a note on *Pagoa geoffroyi*. There is an erratum on page xvii to the effect that the first paragraph on p. 347 is to be deleted as it does not refer to the species there discussed.

Volume IV. Anseriformes and Pelecaniformes.

Part I. October 6, 1914. pp. 1-80, pls. 200-209.

Part II. February 17, 1915, pp. 81-192; pls. 210-223.

Part III. June 23, 1915. pp. 193-334 + i-xii, pls. 224-233.

Volume V. Falconiformes and Strigiformes.

Part I. November 5, 1915. pp. 1-152, pls. 234-244.

Part II. February 29, 1916. pp. 153-248, pls. 245-254.

Part III. May 23, 1916. pp. 249-352, pls. 255-266.

Part IV. August 30, 1916. pp. 353-440 + i-xi, pls. 267-274.

There is an extralimital species (*Butastur teesa*) treated at pp. 129-130 and an appendix, pp. 411-423, consisting of some additional notes on species in this volume.

Volume VI. Psittaciformes.

Part I. November 22, 1916. pp. 1-104, pls. 275-282.

Part II. February 6, 1917. pp. 105-216, pls. 283-290.

Part III. April 17, 1917. pp. 217-296, pls. 291-299.

Part IV. June 27, 1917. pp. 297-372, pls. 300-307.

Part V. September 11, 1917. pp. 373-444, pls. 308-316.

Part VI. December 11, 1917. pp. 445-516 + i-xix, pls. 317-324.

There is an Appendix, pp. xv-xviii, consisting of a reprint of a description of *Platycercus elegans fleurieuensis* by Ashby with comments on allied

species. Also a Correction on p. xix where *Nannopsittacus* is renamed *Suavipsitta*.

In this volume the practice of figuring two or more species on the same plate begins in one or two instances and becomes more common in the last few volumes.

Volume VII. Podargiformes, Coraciiformes, Alcediniformes, Meropiformes, Caprimulgidiformes, Micropodiformes, Cuculiformes, Menuriformes.

Part I. March 4, 1918. pp. 1-112, pls. 325-334.

Part II. May 15, 1918. pp. 113-216, pls. 335-342.

Part III. August 26, 1918. pp. 217-320, pls. 343-351.

Part IV. December 19, 1918. pp. 321-384, pls. 352-362. Also a plate of Cuckoos' tails which is not numbered.

Part V. July 10, 1919. pp. 385-499 + i-xii, pls. 363-370.

Beginning with p. 413 a number of species additional to those so far treated in the work are described and figured with no separate heading whatever: *Globicera pacifica* (pp. 414-415, pl. 366); and *Cacomantis castaneiventris* figured on the same plate without text or mention on the cover. Then comes a review of recent work on the Procellariiformes. Then follow, additional species of this group, *Reinholdia reinholdi* (pp. 420-424, pl. 367); *Pterodroma inexpectata* (pp. 425-426, pl. 368); *Diomedea chionopectera* (pp. 427-430, pl. 369); and an additional Parrot, *Psephotellus chrysopterygius* (pp. 431-433, pl. 370); there are Addenda on pp. 433-434 on the generic name *Steganopleura* and on *Psephotellus dissimilis* apparently quite out of place.

Appendix A (pp. 435-442), consists of an addition to the list of works containing new names from 1910-1919, and a list of extralimital genera described in the work so far, most of them in the text without headings.

Appendix B (pp. 443-473) consists of dates of publication of various ornithological works bearing on the birds of Australia with Addenda to Appendix B ((p. 473-477), additional dates furnished by C. W. Richmond.

Extralimital genus and species *Collocalia esculenta* are given special heading on p. 260.

Volume VIII. Passeriformes: Pittidae, Atrichornithidae, Hirundinidae, and Muscicapidae.

Part I. May 5, 1920. pp. 1-80, pls. 371-376.

Part II. June 17, 1920. pp. 81-144, pls. 377-382.

Part III. August 18, 1920. pp. 145-184, pls. 383-388.

Part IV. October 13, 1920. pp. 185-240, pls. 389-394.

Part V. December 15, 1920. pp. 241-316 + i-xiv, pls. 395-399.

There are "Corrections to my check-list" on pp. xiii-xiv and a further note on *Atrichornis* in the preface p. xii.

There is an extralimital genus *Hypurolepis* on p. 41 and two extralimital species *H. javanica fontalis* (p. 41) and *Hirundo rustica gutturalis* (p. 40).

Volume IX. Passeriformes: Muscicapidae (concluded), Campophagidae, Sphecotheridae, Orthonycidae, Cinclosomatidae, Turdidae and Sylviidae.

Part I. February 15, 1921. pp. 1-48, pls. 400-405.

Part II. April 15, 1921. pp. 49-96, pls. 406-411.

Part III. June 20, 1921. pp. 97-144, pls. 412-417.

Part IV. October 19, 1921. pp. 145-192, pls. 418-424.

Part V. December 15, 1921. pp. 193-240, pls. 425-429.

Part VI. February 15, 1922. pp. 241-304, pls. 430-436.

Part VII. April 4, 1922. pp. 305-360, pls. 437-442.

Part VIII. May 22, 1922. pp. 361-416, pls. 443-448.

Part IX. August 3, 1922. pp. 417-518 + i-xiv, pls. 449-453.

There is an extralimital species, *Sphecotheres stalker*, under special heading on p. 169, and an addendum to *Leachena crocea boweri* without any heading and not indexed, on p. xii.

Plate 426, *Samuela marginata* bound in at p. 226 should be transferred to p. 198 and plate 430, *Hylacola pyrrhopygia* and *H. cauta* not published until Pt. VI, should be substituted at p. 226.

Volume X. Passeriformes: Sylviidae (concluded), Artamidae, Prionopidae and Cracticidae.

Part I. September 28, 1922. pp. 1-56, pls. 454-459.

Part II. December 12, 1922. pp. 57-136, pls. 460-465.

Part III. January 30, 1923. pp. 137-208, pls. 466-471.

Part IV. March 19, 1923. pp. 209-264, 472-477.

Part V. April 24, 1923. pp. 265-344, pls. 478-483.

Part VI. June 5, 1923. pp. 345-416, pls. 484-489.

Part VII. July 26, 1923. pp. 417-451; + i-xi, pl. 490.

One extralimital species is treated at p. 29, *Sericornis tyrannulus*.

Volume XI. Passeriformes: Falcunculidae, Shenostomidae, Sittidae, Climacteridae, Zosteropidae, Dicaedidae, Pardalotidae Nectariniidae and Melithreptidae.

Part I. October 8, 1923. pp. 1-56, pls. 491-496.

Part II. November 21, 1923. pp. 57-120, 497-502.

Part III. December 27, 1923. pp. 121-200, pls. 503-508.

Part IV. February 20, 1924. pp. 201-296, pls. 509-514.

Part V. April 2, 1924. pp. 297-360, pls. 515-520.

Part VI. June 21, 1924. pp. 361-416, pls. 521-526.

Part VII. July 31, 1924. pp. 417-472, pls. 527-532.

Part VIII. October 25, 1924. pp. 473-528, pls. 533-538.

Part IX. December 22, 1924. pp. 529-593, pls. 539-541 + i-xiii.

There are "Additions" at pp. 413-416 and 476-477 containing supplementary notes on several species. Also Errata on p. xiii, and Note on *Lichmera albo-auricularis*, p. 428. *Whilocka wellsii* listed as a distinct species in the Contents, though not numbered, is treated under *W. melanura* on p. 128.

Volume XII. Passeriformes, Melithreptidae (concluded), Motacillidae, Alaudidae, Ploceidae, Oriolidae, Dieruridae, Graculidae, Ptilonorhynchidae, Paradisidae, Corvidae, Corcoraciidae and Struthidiidae.

Part I. March 3, 1925. pp. 1-48, pls. 542-547.

Part II. May 11, 1925. pp. 49-88, pls. 548-553.

Part III. June 22, 1925. pp. 89-128, pls. 554-557.

Part IV. August 31, 1925. pp. 129-184, pls. 558-563.

Part V. November 23, 1925. pp. 185-224, pls. 564-570.

Part VI. March 24, 1926. pp. 225-264, pls. 571-577.

Part VII. June 28, 1926. pp. 265-320, pls. 578-583.

Part VIII. September 6, 1926. pp. 321-360, pls. 584-589.

Part IX. December 9, 1926. pp. 361-404, pls. 590-595.

Part X. February 8, 1927. pp. 405-454 + i-xii, pls. 596-600.

A note on *Donacola thorpei* is added on 203. Plate 600 represents the adult female of *Samuela alesteri* with comments and a note on *S. cinnamomea* (pp. 426-427). The female of *Stipiturus ruficeps* is figured on the same plate but with no mention in the contents. There are also "Corrections and additions to my Check-List" Part II (pp. 429-431) and an Appendix consisting of a continuation of Supplement No. II, pp. vii-xvi being an additional list of papers in which new names for Australian birds appear from 1923 to 1926.

Supplement I. February 16, 1920. Check-List Part Casuariiformes to Menuriformes. pp. i-iv and 1-116. Genera 1-279. Species 1-334.

On p. 107 is a list of authors of the 356 species given in this part. There is an appendix containing 22 additional species which have occurred less than three times in Australia, two being of very doubtful occurrence. At the end is a list of species which should now be eliminated from the Australian list (pp. 109-115) and finally some additions to synonymies in volumes II and VII.

Supplement II. July 26, 1923. Check-List Part II. Passeriformes (in part). pp. i-xvi and 117-156. Genera 280-366. Species 335-456.

On pp. i-xvi are corrections to part I of the Check-List (pp. i-vi) including a list of authorities for the names in Part II. Also an Appendix containing lists of papers in which new names for Australian birds appeared, 1907-1922.

Supplement III. September 8, 1924. Check-List Part III. Passeriformes (concluded). pp. i-viii and 157-244. Genera 367-495. Species 457-656.

A hypothetical list on p. 219 adds two species and one genus, and there follows a list of authorities for the "683" [=680?] species presented in the entire work, all on the same page. There are further "Additions and Corrections" to former parts of the Check-List (pp. 221-224) ending with a lot of incomplete figures, as to the number of species mentioned and

figured, etc. in the work. An index to the three parts of the Check-List concludes this part (pp. 224-244).

Supplement IV. April 6, 1925. Bibliography of the Birds of Australia.

The introduction (pp. i-viii) consists of biographical notices of C. Davies Sherborn and Charles Wallace Richmond with portraits, forming one unnumbered plate. The Bibliography (pp. 1-96) is arranged alphabetically by authors and general works in one series. This part breaks in the middle of the article on the 'Naturalists' Library.'

Supplement V. June 22, 1925. pp. 97-149. Bibliography (completed).

While the text for each species has the order and family given at the top of the first page the use of order and family headings is very inconsistent and often they are omitted entirely. In Vol. I, they are used throughout often with considerable descriptive matter, before the species are taken up, but from Vol. II to Vol. VI the family (and two orders in Vol. III) headings are omitted. In Vol. IX about half the family headings are omitted and in Vol. XII all but one. The treatment of family names in the "Contents" to each volume is still more irregular.—W. S.

Hellmayr's Catalogue of the Tyrannidae.—Part V of the 'Catalogue of Birds of the Americas'¹ by Dr. Charles E. Hellmayr forms a bulky volume of over 500 pages and is devoted entirely to the Tyrannidae. This is, we believe, the first complete treatment of the Tyrant Flycatchers since Sclater's monograph, forming Vol. XIV of the British Museum 'Catalogue of Birds,' published nearly forty years ago. The vast increase of material and of our knowledge both of the life of the American tropics and of ornithological literature have made this earlier work sadly out of date and every systematic ornithologist will welcome Dr. Hellmayr's timely volume.

This family is probably the most puzzling of all the American Passerine groups and we are most fortunate in having the benefit of Dr. Hellmayr's views on the species and subspecies and their relationships, since he is not only one of the leading authorities on Neotropical birds, but has for the past twenty-five years made a specialty of the Tyrannidae.

His attitude regarding genera is, as in his preceding volume on the Dendrocolaptidae and Formicariidae, commendably conservative nor does he endorse some of the recent suggestions as to the relationship of certain genera. He tells us in the preface that he cannot agree with Mr. Ridgway in his views upon the taxonomic value of the tarsal covering and feels that the transfer of certain genera and species to allied families on this character are not warranted, and that they had better be left in the

¹ Catalogue of Birds of the Americas and the Adjacent Islands, in Field Museum of Natural History, etc. Initiated by Charles B. Cory continued by Charles E. Hellmayr. Part V. Tyrannidae. Field Museum of Natural History Publication 242, Zoological Series, Vol. XIII. Chicago, April 11, 1927. pp. 1-517.

Tyrannidae until their internal anatomical characters are ascertained. Dr. Hellmayr follows pretty closely the scheme of classification proposed by the late Count von Berlepsch and divides the family into seven sub-families with the following number of genera; Fluvicolinae (7), Tyranninae (13), Myiarchinae (20), Platyrinchinae (5), Euscarthminae (25), Serpophaginae (9) and Elaeniinae (16).

The method of treatment of the species follows that adopted in previous parts of the work and the wealth of descriptive foot notes and abundance of localities cited are a great help to the student.

The following new forms and genera are proposed: *Agriornis montana intermedia* (p. 5) Tacna, Chile; *Muscisaxicola rufivertex pallidiceps* (p. 21) San Pedro, Antofagasta, Chile; *Ochthoeca rufispectoralis centralis* (p. 49) Pano Mts., Peru; *Knipolegus lophotes* (p. 67) for *K. comata* preoccupied; *Empidonomus aurantio-atro-cristatus minor* (p. 116) Maranhao, Brazil; *Myiarchus ferox australis* (p. 177) Agua Suja, Brazil; *Myiochanes cinereus pallescens* (p. 194) Bahia, Brazil; *Cnemotriccus poecilurus venezuelanus* (p. 226) Menda, Venezuela; *Terenotriccus erythrurus brunneifrons* (p. 231) Tres Arroyos, Bolivia; *Myiobius atricaudus snethlagei* (p. 240) Maranhao, Brazil; *Todirostrum viridanum* (p. 301) Rio Auraro, Venezuela; *Poecilotriccus ruficeps melanomystax* (p. 325) Salento, Colombia; *Elaenia albiceps chilensis* (p. 413) Curacautin, Chile; *Phyllomyias brevirostris cearae* (p. 465) Ceara, Brazil. New genera: *Neoxolmis* (p. 39) type *Tyrannus refiventris* Vieill., *Cnemotriccus* (p. 221) for *Empidochanes* which is a synonym of *Myiophobus*; *Tolmomyias* (p. 273) type *Platyrhynchus sulphureus* Spix; *Uromyias* (p. 378) type *Euscarthmus agilis* Sel.—W. S.

Bent's 'Life Histories of North American Marsh Birds.'—Mr. Bent's sixth volume¹ of life histories of North American Birds covers the Flamingo, Herons, Ibises, Rails, etc., and is larger than any of its predecessors. The treatment follows exactly the same plan and the work is fully up to the high standard previously established. There are ninety-eight plates most of them consisting of two views and they contain some very fine examples of bird photography.

We continue to be amazed at the amount of material that Mr. Bent has brought together and the comparatively short time that it has taken him to prepare his volumes for the press as well as the excellent judgment that he has shown in selecting material from the literature. Dr. C. W. Townsend has prepared five of the life histories and Mr. T. E. Penard that of the Scarlet Ibis, while Rev. P. B. Peabody is responsible for much of the account of the Yellow Rail.

We can add but little to what we have already said in previous reviews as to the excellence of Mr. Bent's work. Ornithologists will find it a

¹ Life Histories of North American Marsh Birds. Orders Odontoglossae, Herodiones and Paludicolae. By Arthur Cleveland Bent. Bulletin 135, U. S. National Museum. 1926 [= March 11, 1927] ad C. W. Richmond pp. i-xii + 1-400, pl. 1-98.

storehouse of information, a reference work to turn to, and an entertaining piece of ornithological literature. We notice an ever increasing list of acknowledgements and would once more urge those who have the time for field work and have secured information that they have reason to think would prove acceptable, to communicate with Mr. Bent at once. There may yet be time to include items regarding the Shorebirds while the life histories of all of the "land birds" are yet to come.—W. S.

Hoffman's 'Birds of the Pacific States.'—Mr. Ralph Hoffmann, well known for his 'Guide to the Birds of New England and Eastern New York,' has for some years been a resident of California and is now director of the Museum of Natural History at Santa Barbara. Fortunately for himself and for many others his interest in bird life has not suffered by his change of residence, and he has made good ornithological use of his time to judge by the little book¹ that he has just issued on the 'Birds of the Pacific States.' The keynote to this publication is field identification and the 400 odd species are described with this object always in view. Under each specific heading is from half to three quarters of a page descriptive of the mode of occurrence, characteristic actions, song, etc., of the bird under consideration; then come the measurements of length and extent and a concise description of the points best seen in the field followed by a brief statement of the bird's distribution in California, Oregon and Washington. If there happen to be two or more subspecies they are usually listed in this distributional paragraph with the range of each in the three States, but with no mention of their distinctive characters. Occasionally, however, the same treatment is given subspecies as that accorded to a species as in the case of the three White-crowned Sparrows and the Olive-backed and Russet-backed Thrushes. The various races of Song Sparrows are however all lumped together as are those of Hermit Thrushes and Fox Sparrows.

Inasmuch as subspecies are based not upon degree of difference but upon the criterion of intergradation, while field identification is concerned with degree of difference without caring whether intergradation occurs or not, it seems perfectly proper to be inconsistent and to treat as "ornithological units" all forms that are sufficiently different to be clearly identifiable in the field.

The practical elimination of the subspecies in this work gives us what Dr. Joseph Grinnell suggested sometime ago as an interesting experiment *i. e.* a list of the *species* of Californian birds. A still more striking feature however is the adoption of the classification of the new A. O. U. 'Check-List' so that this book of Mr. Hoffmann's is the first to present the birds

¹ Birds of the Pacific States, Containing Brief Biographies and Descriptions of about Four Hundred Species, with especial reference to their appearance in the Field. By Ralph Hoffmann, with Ten Plates in Color and over Two Hundred Illustrations in Black and White, By Major Allan Brooks, Boston and New York. Houghton Mifflin Company. The Riverside Press Cambridge. 1927. pp. i-xix + 1-353. Price \$5.00.

of any part of the United States in the new sequence. After forty years of the old classification it seems strange to find the Thrushes in the middle of the Passeres and the Finches at the end while the Birds of Prey are in between the Ducks and the Gallinaceous species, but this is the sequence that we shall all have to accustom ourselves to for some time to come and the sooner we learn it the better. Some of us began years ago with the Birds of Prey at the top of the list and then for a time were accustomed to beginning instead of ending with the Thrushes and have found little trouble in making the changes.

Mr. Hoffman has, we consider, produced an admirable work, one of the best field books, in fact, that has yet appeared.

So much for the text but the illustrations demand separate consideration they are all by Major Allan Brooks and comprise ten plates in color and 200 line drawings in the text. They show Major Brooks at his best. The colored plates are beautifully delicate paintings—notably those of the Phalaropes and Hummingbirds, but some of them seem to have received too much red in the printing. The line drawings are especially notable for the originality of posing and as we turn the pages it is a constant delight to see a familiar bird in a characteristic position not usually portrayed by an artist. This is particularly the case in the number of species drawn in flight. Usually we find only the Gulls, Terns, Hummers, and Swallows so drawn, but here we see the Loon, Cormorant, Shrike, Magpie, most of the Hawks, Woodpeckers, etc., on the wing.

Both Mr. Hoffman and Major Brooks are to be congratulated upon their work which will be in great demand by residents and visitors interested in learning from personal observation something of the bird life of the Coast.—W. S.

Grinnell and Wythe on Bird Life of the San Francisco Bay Region.—Dr. Grinnell and Miss Wythe have compiled a work on the Bird Life of the San Francisco Bay Region¹ that is rather different from anything in the way of a local list that has yet appeared. In fact the authors have termed it a "directory" and their object in its preparation has been to provide help and incentive toward an increased knowledge of the bird life of the region covered and to furnish an accumulation of facts and citations likely to prove useful to the student of the living bird.

The publication seems to realize the intention of its authors admirably. Not only is there a bibliography arranged according to counties and towns but under each species is a statement of the character of its occurrence with lists of localities where it has been found, also information regarding its nesting, migration dates and references to the most important publi-

¹ Directory to the Bird-Life of the San Francisco Bay Region. By Joseph Grinnell and Margaret W. Wythe. Cooper Ornithological Club, Pacific Coast Avifauna Number 18. Berkeley, California. Published by the Club March 29, 1927. pp. 1-180. Price \$4.00. W. Lee Chambers, Drawer 123, Eagle Rock, Los Angeles, Calif.

cations relating to it. The obvious result is to equip the earnest student with the most important facts regarding the bird so far accumulated, in the shortest possible time, so as to enable him to go on and add to our knowledge instead of spending years in acquiring this information by personal observation. It has always struck us that the saddest thing about the acquirement of knowledge was the impossibility of any individual passing on to his successors more than a fraction of what he has accumulated and if Dr. Grinnell's plan will remedy this condition, as it doubtless will, it is very well worth while.

There is but one criticism that we have to make of the work and that is the camouflaging of familiar birds under a host of new names—"common names" in this instance, and often only lengthened or modified, yet all sufficient, we fear, to confuse the very persons who are expected to benefit by the work.

Apparently the idea is to have the English names parallel the Latin ones so far as possible and make them into a trinomial whenever the latter name takes that form, as for instance, "Slender-billed White-breasted Nuthatch," but everyone knows the bird as "Slender-billed Nuthatch," and all the literature for years back is under that name. Furthermore the field student, so far as our experience goes, does not care whether it is a subspecies of the White-breasted Nuthatch or not. Moreover he will wonder why the California Cowbird and the Nevada Cowbird escaped trinomialism and whether they are somehow full species and why the California Purple Finch was not shortened to a binomial to match its Latin equivalent. If we have to rely on the Latin names to answer these questions why not let them explain *relationship* in all cases and leave the English names, our only hope of stability, alone. Already we have a query from an oölogist, a group who very properly use only English names in their business, as to whether Dr. Grinnell has made a new race of the Black-throated Blue Warbler that breeds in Canada since he lists an apparently new bird as the "Canadian Black-throated Blue Warbler!"

It is impossible to make a consistent system of "common" names and in any attempt they immediately become book names and are no longer "common." Surely one set of names built up on a system is enough so let our vernacular names be monosyllables or sesquipedalian but stick to them, and where we have none adopt one book name which may eventually become a vernacular.

We know that Dr. Grinnell was most sincere in his effort and intention but we fear that he has to some extent defeated his object by his innovations. Others have tried similar schemes but apparently the new names have never become current and we cannot imagine such cumbersome names ever being generally adopted.

For every other feature of the "Directory" we have the highest praise.—W. S.

Mailliard on the Birds of Modoc Co., California.—A preliminary

trip in 1923 followed by more extended trips in the three following years furnished the main materials for this report¹ to which have been added notes furnished by the Museum of Vertebrate Zoology and those gleaned from published accounts of the region.

Modoc is the extreme northeastern county of California and for that reason is particularly interesting in connection with the distribution of species and the possibility of the occurrence of additional forms. Mr. Mailliard lists 196 species and subspecies of birds so far detected within its boundaries, and presents interesting field notes regarding many of them. Both Little Brown and Sandhill Cranes occur and local hunters contend that flocks of the two can easily be distinguished by size and habits.

Five additional birds are given in a hypothetical list and an annotated list of the mammals of the county is appended.

Mr. Mailliard has made a valuable contribution to the faunal lists of California.—W. S.

Bailey's 'Biological Survey of North Dakota.'—A welcome publication is Vernon Bailey's 'Biological Survey of North Dakota'² even though the bird portion has been postponed for a time, to appear as a separate publication. The present volume is devoted almost entirely to the mammals which are treated at length but there is a two page preface and a consideration of physiography and life zones covering fourteen pages, with an excellent map. This nearly level State is almost wholly in the Transition Zone with a small Canadian area in the center of the northern boundary where the Turtle Mountains reach over from Canada and three intrusions of the Upper Austral fauna following up the Yellowstone, Little Missouri and Missouri Rivers.

Characteristic species of mammals, plants and birds are given for the three zones, the Junco and White-throated Sparrow being the only Canadian birds breeding in the State. In mentioning the earlier explorers of the State Mr. Bailey omits Dr. William L. Abbott who spent the month of July 1879 at Pembina and vicinity, though probably purely ornithological papers were purposely omitted. At any rate Dr. Abbott published an account of the birds he observed, in 'Forest and Stream,' XIII, p. 984-5, and his collection made on this occasion is preserved in the Academy of Natural Sciences of Philadelphia.—W. S.

Bannerman on the Birds of Tunisia.—In the early part of 1925, Messrs. Willoughby P. Lowe and David A. Bannerman made an extensive expedition through Tunisia for the purpose of securing a representative

¹ The Birds and Mammals of Modoc County, California, By Joseph Mailliard. Proc. California Acad. of Sciences. Fourth Series, Vol. XVI, No. 10, pp. 261-359, 1 text figure. April 27, 1927.

² A Biological Survey of North Dakota. I. Physiography and Life Zones. II. The Mammals, By Vernon Bailey. U. S. Dept. of Agriculture, Bureau of Biological Survey. North American Fauna No. 49. pp. 1-226, pls. 1-21 and 8 figures. Price 60 cents.

collection of birds of the country for the British Museum, the trip being made possible through the generosity of Mr. A. S. Vernay.

The country is by no means virgin ground ornithologically, as it was, some years ago, thoroughly worked over by Mr. J. I. S. Whitaker whose collection, the basis of his 'Birds of Tunisia' is now at his home in Palermo, Italy. M. Louis Levauden, now resident in Tunisia, also Bede and Blanchet made very complete collections and together with other French ornithologists have contributed largely to our knowledge of the ornithology of the country.

Mr. Bannerman has now published the results of the British Museum expedition as a special supplementary number of 'The Ibis,'¹ which contains the itinerary, and account of the physical features of Tunisia and a fully annotated list of the birds, together with many beautiful reproductions of photographs of the country, and a map.

Tunisia is divided into two main divisions by the author, the northern cultivated and forested region and the southern more or less desert area, and he describes no less than ten faunal subdivisions which impressed him while travelling, although upon working out his report he adopts the six regions delimited by M. Levauden. These are (1) the forested area on the northern Mediterranean coast, (2) the broad cultivated region lying to the south, (3) the maritime plains on the east coast, (4) the steppe country south of "2," (5) the semidesert strip and (6) the extended true desert south of Djerid.

The narrative gives one a good idea of the character of the country that the expedition passed through and illustrates the great variety of physical conditions as we pass from north to south. The annotated list is carefully prepared and is full of notes on the habits and distribution of the species as well as discussions on relationship and nomenclature.

The expedition brought back 740 bird skins together with some mammals and a good series of dried plants. Only one new form was secured—*Erithadus rubecula lavaudeni* which has already been published. Mr. Bannerman is to be congratulated upon an excellent report.—W. S.

Reiser on Bird's Eggs from China and Tibet.—This report² is based on the collections of Dr. Hugo Weigold who accompanied Walter Stötzner's expedition to Szetschwan, East Tibet and Tschili, in 1914. It consists of an annotated list of sets of eggs of thirty-four species with detailed measurements.—W. S.

¹ Report on the Birds collected and observed during the British Museum Expedition to Tunisia in 1925. By David A. Bannerman. The Ibis (Twelfth Series) Vol. III. Supplement, 1927. March pp. 1-213, pl. I-IX.

² Zoologische Ergebnisse der Walter Stötznerschen Expeditionen nach Szetschwan, Osttibet und Tschili auf Grund der Sammlungen und Beobachtungen Dr. Hugo Weigolds. 4. Teil. Vögel, von Otmar Reiser. Abhandl. und Berichte der Mus. für Tierkunde und Völkerkunde zu Dresden. Band XVII (1927) April 5, 1927.

Recent Papers by Delacour.—M. Jean Delacour has recently published an account¹ of the birds of Japan in which he describes his observations during a visit to that country, as he returned from his collecting expedition to French Indo-China. There is a brief account of the wild bird life of the country but the paper is mainly devoted to avicultural matters. The aviaries, cages etc., used by the Japanese are explained and figured and the principal zoological gardens and private and public parks where birds are kept are described.

An account of the long tailed Japanese fowls is also given with details as to their breeding and care. Many excellent half-tones illustrate this interesting pamphlet.

Another paper² by the same author deals with the Black-necked Crane (*Megalornis nigricollis*) one of the rarest of the Cranes and next to the American Whooping Crane the nearest to extinction at the present time.

Mr. Delacour has also published a brief resume³ of his second expedition to French Indo-China.—W. S.

'Bulletin of the International Committee for Bird Protection.—

This report⁴ published by the Committee and copyrighted by the president Dr. T. Gilbert Pearson, lists the members of the committee and the societies coöperating with it. This is followed by an outline of the principles of the organization, an account of the activities of the president in visiting the various countries of Europe in the interests of bird protection, as well as the efforts made to stop the present exportation of Tinamous from Argentina and to check the destruction of Bald Eagles in Alaska, where no less than 41000 of these splendid birds have been slaughtered to date. There are also sectional reports from the various countries regarding the status of bird protection. The report is rendered more interesting by the inclusion of photographs of many of the members of the committee.

The International Committee deserves all praise for its work and every encouragement as only by such combined action can many of the problems of bird conservation be solved.—W. S.

Stresemann on Collocalia brevirostris.—Dr. Stresemann in a review⁵ of this species recognizes twelve subspecies of which *C. brevirostris vulcanorum* (p. 352) is described as new. A complete list of the names

¹ Les Oiseaux au Japon. By J. Delacour. Revue d'Hist. Nat. Appliquee, Deux. Partie. Vol. VII, No. 8-9-10. 1926. pp. 1-48.

² La Grue a Cou Noir. By J. Delacour. Ibid Vol. VI, No. 9. Sept 1925. pp. 1-4.

³ Short Report on the Second Expedition to French Indo-China (1925-26). By J. Delacour, P. Jabouille and Willoughby P. Lowe. Ibis, January 1927, pp. 132-134.

⁴ Bulletin of the International Committee for Bird Protection. Published by the Committee, 1974 Broadway, New York, 1927. pp. 1-52.

⁵ Beiträge zur Ornithologie der indo-australischen Region. II. von E. Stresemann. Sonderabdruck aus Mitteilungen aus dem Zool. Museum in Berlin. 12. Bd. 2. H. August, 1926. pp. 349-354.

heretofore proposed for forms of *Collocalia* is appended with the status of each.—W. S.

Preble on the Woodcock.—Mr. E. A. Preble has published a most interesting and well written sketch¹ of the Woodcock and an earnest plea for saving the remnant of this once abundant bird from extinction.

Sportsmen may as well recognize the fact that certain species are bound to be exterminated if their hunting is continued and such birds should be placed on the protected list as soon as possible, while there is still a chance to save them.

With the adoption of the Migratory Bird Treaty in 1916 most of the shorebirds were placed on the closed list; last year the shooting of Black-breasted Plover was prohibited and this year the Yellow-legs receives complete protection. Why not add the Woodcock? Any objection that can possibly be made will come from those who are too selfish and greedy to give up their personal pleasure for the pleasure of a vastly larger proportion of the community who are interested in saving wild life from annihilation, and enjoying its presence.—W. S.

Miller on Structural Variations in Scoters.—Mr. Miller presents some important structural characters in this paper² which emphasize the difference between the two genera of Scoters, *Oidemia* and *Melanitta* now generally recognized. The most conspicuous of these are the great difference in the trachea and the remarkable abbreviation in the intestinal caeca of *Oidemia*, which resemble those of the Mergansers, while in most other ducks, including *Melanitta*, they are long and slender.

The Surf Scoter (*Pelionetta*) he still regards as close to *Melanitta* and best regarded as a subgenus. The paper is welcome as strengthening our present arrangement of these interesting Ducks.—W. S.

Recent Papers by Dwight and Griscom.—Mr. A. W. Anthony has been collecting birds in the mountains of northern Guatemala for Dr. Jonathan Dwight and among other interesting specimens has secured a remarkable Tyrant Flycatcher³ apparently belonging to a new genus and species which has recently been described by Dr. Dwight and Mr. Ludlow Griscom under the name *Xenotriccus callizonus* (p. 2) Lake Atitlan (5500 ft.). In color it is unique among Central American Flycatchers—brown above and yellow below, with a conspicuous rufous breast band—while in general appearance it suggests *Aphanotriccus* though it has an occipital crest and longer tail and tarsus.

¹ The Vanishing Woodcock. By Edward A. Preble. Nature Magazine, April, 1927. pp. 235-240.

² Structural Variations in the Scoters. By W. DeW. Miller. American Museum Novitates, No. 243, December 31, 1926. pp. 1-5.

³ A New and Remarkable Flycatcher from Guatemala. By Jonathan Dwight and Ludlow Griscom, American Museum Novitates, No. 254, March 8, 1927. pp. 1-2.

Another paper¹ by the same authors reviews the Blue Grosbeaks (*Guiraca caerulea* subsp.) of which five races are recognized. Neither of the names by which our bird of the southwestern United States has been known prove applicable. *G. c. eurhyncha* of Coues is evidently based on the southern Mexican bird, although he gave only "Mexico" as his type locality and our authors have apparently been unable to locate his type, as they make no reference to it. Unfortunately they too have failed to designate a definite type locality which should have been done under the circumstances. The type specimen of *Pitylus luzula* another name that has been attributed to our bird is pretty definitely shown to have come from San Carlos, Salvador, and our authors restrict this name to the resident Blue Grosbeak of Central America. The California form is recognized as distinct under Grinnell's name *salicaria* and our southwestern form thus left nameless. For it they propose *G. c. interfusa* (p. 4), selecting a specimen from Ft. Lowell, Arizona as their type.

Nelson's *chiapensis* is considered as a synonym of *eurhyncha*.—W. S.

Lewis on the Production of Eider Down.—Mr. Harrison F. Lewis has recently published for the Canadian Government an interesting report² on the Eider Duck and the commercial possibilities of developing the Eider down industry in Canada, an industry which is now practically restricted to Iceland.

The Canadian National Parks Service is using every effort to interest the people resident in the region where the Eider Ducks breed, in the protection of the bird and the development of the down industry, and this pamphlet is issued as part of this propaganda. Those who attended the Ottawa meeting of the A. O. U. will recall Mr. Lewis's practical demonstration of the method of cleaning the down which is fully described in the pamphlet before us.

We learn further that the first gathering of the down is made about the time when the bird begins to set. She will replace what is taken with the down remaining on her breast and no further gathering should be made until the young leave the nest. A further gathering of the best of the remaining down is then made immediately.

Descriptions and figures of the cleaning frames are presented and details about heating and cleansing the down are explained. The report is a valuable economic paper and we sincerely hope that it will result in the saving of this splendid bird from further decimation as well as in the development of an additional industry which has great possibilities for profit. Mr. Lewis is to be congratulated on his work in behalf of the Eider and upon a well prepared report.—W. S.

¹ A Revision of the Geographical Races of the Blue Grosbeak (*Guiraca caerulea*) By Jonathan Dwight and Ludlow Griscom. Ibid. No. 257, March 14, 1927. pp. 1-5.]

² Producing Eider Down. By Harrison F. Lewis. Canadian National Parks Branch, Department of the Interior, Ottawa, Canada, where copies of the report may be obtained.

Chapman on *Saltator aurantirostris*.—Dr. Chapman having worked out the distributions and variations in this interesting species proceeds in the paper before us¹ to name three new subspecies and then to discuss at length the meaning of the variations and the probable origin of the seven recognized races, as well as of *Pitylus nigriceps* which he now regards as a *Saltator* closely allied to *aurantiurostris*.

The paper is worthy of the careful study by all engaged in systematic ornithology as well as those interested in the subject of the origin of species, and the author's conservatism in matters nomenclatural as well as his hesitancy to theorize too far will we think be generally endorsed.

Briefly summarized his theory is that in *aurantiurostris* we have in all probability the ancestral form of the group, a species of great individual variability. If it possessed no tendency to extend its range or if there were no available habitats into which it might spread, the history of the species would end at this point. As a matter of fact however both these conditions have been present and new environments combined with the inherent plasticity of the species have produced new races all along the Andes which show interesting and confusing departures from, or reversions to, individuals of the original variable form. His evidence and its discussion furnish an excellent illustration of the impossibility of correctly interpreting nature by merely naming variations in color and size and trying to place every specimen accordingly. To quote Dr. Chapman, "The variations exhibited by *S. aurantiurostris* are mutational in origin and have become subspecific characters under environmental conditions." We further gather from his discussion that cell variation (mutation) and environmental influence may work together in the evolution of species, which seems to us quite in accord with other recent discussions on evolution which apparently show that not one but several factors or methods, are usually involved.

Numerous text figures illustrate variations in pattern in the various forms discussed while a map gives one a clear idea of their distribution. Dr. Chapman is to be congratulated upon another contribution to the broader side of ornithology and demonstrates a comment made by the reviewer some years ago that ornithology presents some of the best material for the study of evolution if ornithologists could be induced to turn their attention to that phase of the science instead of sticking so closely to the purely systematic side.—W. S.

Griscom on Birds of Yucatan.—Two recently published papers² by Ludlow Griscom deal with the ornithological results of the Mason-Spinden Archaeological Expedition to Yucatan which he accompanied as a representative of the ornithological department of the American Museum of Natural History.

¹ The Variations and Distribution of *Saltator aurantiurostris*. By Frank M. Chapman. American Museum Novitates, No. 261. March 28, 1927.

² The Ornithological Results of the Mason-Spinden Expedition to Yucatan Part I American Museum Novitates, No. 235, November 18, 1926. pp. 1-19. Part II. Ibid. No. 236. November 19, 1926. pp. 1-13.

Part I describes the itinerary which followed the coast of Quintana Roo and British Honduras visiting Cozumel Island and the mainland opposite. A list of the 347 species known from Yucatan is given, divided into several groups according to character of occurrence, the endemic forms numbering 44. Mr. Griscom explains that the peninsula of Yucatan is similar to a more or less arid island cut off on the southwest by a heavy rain forest and that its avifauna is largely composed of species or genera of relatively wide range in Mexico and northern Central America but absent from the rain forest, and many of the endemic forms are the result of this isolation.

Next there is an annotated list of 167 birds observed in eastern Quintana Roo of which *Dichromanassa rufescens colorata* (p. 9) and *Phoenicotherapia salvini rooensis* (p. 17) are described as new as well as *Cochlearius zeledoni panamensis* (p. 11) from Corozal, Panama and *Icterus cucullatus masoni* (p. 18) from Manatee, British Honduras.

The Osprey of the region is identified as *Pandion h. ridgwayi* previously supposed to be restricted to the Bahamas.

In Part II, there are two annotated lists. The first, covering 34 species, found on Chinchorro Bank, twenty-five miles off the coast, and hitherto unvisited by any ornithologist. An *Elaenia* obtained here allied to *E. martinica* is described as *E. chinchorrensis* (p. 3).

The second list covers the birds of Cozumel Island with remarks on the more interesting species.—W. S.

Friedmann on Testicular Asymmetry in Birds.¹—It has long been known that the left testis in birds is often (Newton says, generally) larger than the right and Oscar Riddle has found that in hybrid Pigeons the discrepancy increases in proportion to the difference in relationship in the species involved, being greater in crosses between birds of different genera than between congeneric species. Furthermore the excess of males has been found to be correlated with the amount of discrepancy in the size of the testes.

Dr. Friedmann has examined many breeding birds both in America and in South Africa and finds that in 104 species there was no discrepancy while 60 showed the left testis to be the larger. In most cases it was obviously impossible to determine from field observations whether there was an excess of males, since male birds, being more active and conspicuous than females, are more frequently seen and collected.

In the case of the Cowbirds, however, he found that the parasitic species were usually polyandrous with a very evident excess of males and this was always correlated with a decidedly larger left testis as well as with sexual dimorphism in plumage. In the two monogamous Cowbirds, *Agelaius badius* and *Molothrus rufo-axillaris* there is no excess of males and no dimorphism in plumage, while the testes are of equal size. The former

¹Testicular Asymmetry and Sex Ratio in Birds. By Herbert Friedmann. Biological Bulletin, Vol. LII, No. 3, March, 1927. pp. 197-207.

species moreover is not parasitic while in the latter, parasitism is of the simplest type.

This paper is another of the results of Dr. Friedmann's study of parasitism in birds which has taken him to all countries where parasitic birds are to be found and where he has gathered valuable material and observations which will undoubtedly throw much light upon this interesting problem.

A list of the species observed grouped according to the development of the testes concludes the paper.—W. S.

Balsac's Ornithology of Central Sahara and Southern Algeria.—The present report¹ is based on an expedition conducted by the author through the lower Atlas Mountains and southward across the Sahara to Fort Miribel and eastward to Sedjera-Touila, with a side trip from Ghardaia to Guerrera.

The list of birds is very fully annotated and the relation of the forms to allied species is discussed, forming a very valuable addition to our knowledge of the avifauna of the region. One new subspecies was obtained which has been described elsewhere—*Ammomanes deserti intermedia*. *Comatibis eremita* supposed to be extinct in Algeria was found and a colored plate of the adult and young is presented, another bird *Apus affinis galilejensis* was found breeding for the first time in Algeria while 18 others were found breeding for the first time in the district under consideration.

The report is well printed with a good sketch map and several photographs of nests and eggs.—W. S.

Richmond's List of Generic Names of Birds.—This is Dr. Richmond's fourth list² of Avian generic names supplementary to Waterhouse's 'Index Generum Avium.' He lists 378 names proposed during the period 1916-1922 and 57 others hitherto overlooked, making a total of 435. One of the most interesting genera listed in *Fontinalis* proposed by Leo Lesquereux for what he supposed was a fossil plant but which proves to be the impression of a bird feather!

These "supplements" of Dr. Richmond's are of the greatest importance to the systematist furnishing him at once with all the desired information regarding each name, data which it has often taken years to discover. We trust that he will continue the compilation.

Dr. Richmond calls our attention to two errors, which it may be desirable to mention here: *Glaucomorpha* should be *Glauconympha* and *Smitsornis* should be *Smutsornis*.—W. S.

¹ Contributions a l'Ornithologie du Sahara central et du Sud-Algérien. *Helm de Balsac*. Mém. de la Société d'Histoire Naturelle de l'Afrique du Nord. Alger, 1926. pp. 1-127 pl. 1-7.

² Generic Names Applied to Birds, during the Years 1916-1922, inclusive, with Additions to Waterhouse's "Index Generum Avium" By Charles W. Richmond. Proc. U. S. National Museum, Vol. 70, Art. 5, pp. 1-44. 1927.

Williamson's 'The Old Stag.'—Under this title another volume¹ of stories by Henry Williamson has been recently published. Like his previous volume, 'The Lone Swallow', these deal for the most part with nature and are well written and interesting reading. He personifies his wild animal characters but has evidently made a careful study of them and the sketches reflect admirably the characteristics of the species of birds and animals involved.

"Old Nog," the Heron, is pictured seeking food to carry back to the heronry when he is attacked by the Peregrines, "Chakcheks." There is an account of the Buzzard Hawks and their eyrie and "Mewliboy" their downy offspring, while the visit of the Peregrine to London and his attack on the Pigeons which were being fed in the square will recall the winter visits of our Duck Hawk to the heart of many of our large American cities.

Many of the tales are full of the atmosphere of the English country-side and the little volume is a welcome contribution to out-door literature in story form.—W. S.

Scoville's 'Runaway Days.'—Mr. Samuel Scoville, Jr., has recently published in book form² a number of his magazine articles describing nature walks and short trips mainly in the vicinity of Philadelphia and in company of his fellow members of the Delaware Valley Ornithological Club. The latter have already recorded in 'The Auk,' or elsewhere, the bare scientific facts gleaned on these trips which Mr. Scoville here sets forth with all the sidelights and with the atmosphere of wood and swamp which his facile pen is so well able to give us.

Ong's Hat and Foreways are delightful sketches of the New Jersey Pine Barrens, while other chapters describe the famous visit of the Wood Ibises to Cape May, the nesting of the Raven and Pileated Woodpecker in the Pennsylvania Alleghanies and the Eagles' Nests at Bombay Hook, Delaware.

These sketches show Mr. Scoville at his best, writing of personal experiences and of companionship with congenial friends.—W. S.

Dinesen on Birds of Northern Iceland.—Mr. G. B. Dinesen has for ten years been a student and collector of arctic birds in northern Iceland and has published a little pamphlet³ giving his experience with eighty-three species. The work is printed entirely in Danish and is illustrated by several views and photographs of mounted birds.—W. S.

¹ The Old Stag. Stories. By Henry Williamson. New York. E. P. Dutton & Company, 681 Fifth Avenue, 1927. pp. 1-347. Price \$2.50.

² Runaway Days. By Samuel Scoville, Jr., New York. Harcourt, Brace and Company. 1927. pp. 1-25.

³ 10 Aars Ophold iblandt Nordislandske Fugle. Af G. B. Dinesen. G. Dinesen, Dannebrogsgade 8, Kbhun. V., Copenhagen, Denmark. 1926. pp. 1-52. Price 5Kr.

Barbour and Peters on Two More New Birds from Cuba.¹—Before we have had time to recover from our astonishment at the discovery of the remarkable new Wren in the Zapata peninsula of Cuba, Dr. Barbour's collector, Fermin Z. Cervera, has visited the locality again and has secured a Rail and a Finch both of which, like the Wren, are not only new species but cannot be referred to any known genera.

Dr. Barbour obtained the specimens from Mr. Cervera on a recent trip to Cuba and in conjunction with Mr. J. L. Peters has published descriptions of them. The Rail they name *Cyanolimnas cerverai* (p. 95) and the Finch *Torreornis inexpectata* (p. 96). The Rail is said to resemble *Pardirallus ryrtrhynchus* in color and to suggest relationship to the fossil *Nesotrochis* in structure. As to the relationship of the Finch the authors are silent, but promise a later paper which will deal with the affiliations of both birds.

The discovery of three such distinct birds as these would be remarkable anywhere today but in an island supposedly so well known as Cuba it is astonishing.—W. S.

Peters on the Golden Warblers.²—Mr. Peters uses the name Golden Warblers for the resident birds of the West Indies, *Dendroica petechia* and its races, including *D. ruficapilla* regarded by some as specifically distinct. These are contrasted with the migrant *Dendroica aestiva* group—the Yellow Warblers—and the Mangrove Warblers, *D. rufiflora*, *D. erithacoides* and *D. bryanti*.

Fifteen races are recognized of the Golden Warbler group, inhabiting respectively: Jamaica, Cuba, Haiti, Bahamas, Porto Rico, St. Thomas and adjacent islets, Guadeloupe and Dominica, Barbados, Grenada, Islands on the north Coast of Venezuela, Los Roques, St. Andrews, Cozumel, Galapagos, Colombia and Ecuador.

His report is a most careful piece of work and thanks to the activities of previous writers no new names have to be proposed while there are but few synonyms. The most important innovation is the discovery by Mr. Peters that Linnaeus' name *petechia* refers to the Barbados bird and not to that of Jamaica, and that Gosse's name *eoia* is available for the latter.—W. S.

Recent Papers by Lönnberg.—In a report³ on the birds observed on a trip to Lapland and the east coast of Västerbotten the author describes the breeding range and migration of the Redshank (*Totanus totanus*) and suggests that the birds which now breed in the Swedish moun-

¹ Two More Remarkable New Birds from Cuba. By Thomas Barbour and James Lee Peters. Proc. New England Zoological Club, IX, pp. 95-97. May 12, 1927.

² A Revision of the Golden Warblers. *Dendroica petechia* (Linne). By James L. Peters. Proc. Biol. Soc. Washington. Vol. 40, pp. 31-42. March 5, 1927.

³ Nagra ornithologiska anteckningar från en kort resa till Lapland och Västerbottens-kusten 1 aug. 1926. Av. Einar Lönnberg. Fauna och Flora. 1926. pp. 193-208.

tain region must have invaded the country from the west during the glacial period when a series of great lakes occupied approximately the same area.

A female *Harelda hyemalis* in the molt to the eclipse plumage is figured in colors.

In another paper¹ a pair of Herring Gulls are described in which the male had yellow legs but the wing pattern of *argentatus*; the female grayish white tarsi and pink webs but the wing pattern of *cachinnans*. He regards them as hybrids between the two species mentioned and argues that *cachinnans* is therefore only a subspecies of *argentatus*.

A third paper² records the recapture of numerous birds banded in Sweden.—W. S.

Burleigh on Birds of the Georgia College Campus.—Prof. Burleigh has published an annotated list³ of birds observed on the campus of the Georgia State College of Agriculture at Athens, Ga., during his six years residence there. The area of the campus is 830 acres and 173 species have been observed there of which 73 occur in summer while 100 are migrants. Of the summer residents 50 have actually been found breeding in the area and any of the remaining 23 may be expected to breed. Twenty-three additional species have been found in Athens but not, so far, within the limits of the college grounds.

These campus lists as well as lists for parks or other limited areas are of much interest, especially historically, since changing environment as years go by will undoubtedly reduce their totals.

Dr. Joseph Grinnell has published such a list for the University of California and already records⁴ the disappearance of certain forms. He deplors the indefatigable activities of the "tree doctors" who allow no dead limbs or bunches of dead foliage to remain and whose constant spraying drives away the birds which formerly assembled to devour insect pests in the groves. "The natural check to the caterpillar crop is not noticed by the landscape architect and Faculty Glade becomes quickly silent of Warbler voices." The local disappearance of native bird life parallels the removal of the elements of naturalness in the campus flora. We hope Prof. Burleigh will use Dr. Grinnell's remarks in warning his classes in forestry of the danger of being too one-sided.—W. S.

McAtee's Propagation of Game Birds.—Game bird breeding is becoming a more and more important industry in the United States and a necessary one if hunting is to be maintained, since the native supply of

¹ Den gulfotade gråtrutens *Larus cachinnans* Pall., systematiska ställning. Av. Einar Lönnberg. Ibid. pp. 218-222.

² Återfunna ringmärkta fåglar. Av. E. L. Ibid. pp. 227-230.

³ A Preliminary List of the Birds of the Campus of the Georgia State College of Agriculture, Athens, Clarke County, Georgia. By Thos. D. Burleigh. The Cypress Knee, Fifth Annual Edition, 1927. pp. 29-45.

⁴ Phronitistery. By Joseph Grinnell. Univ. of Calif. Chronicle, January, 1927. pp. 104-106.

upland game birds has been largely exhausted and the importation of western stock into the eastern States is yearly becoming more difficult.

In order to encourage this industry the Biological Survey has issued a pamphlet¹ on the subject prepared by W. L. McAtee which gives all desired information on requirements, coops, enclosures, food, pinioning, etc. It is devoted especially to Ring-necked Pheasants, Bobwhite, Mallard and Canada Goose, the game birds that can be most successfully reared, although there is some reference to other species. Numerous illustrations add to the value of the Bulletin.—W. S.

Economic Ornithology in Recent Entomological Publications.—European Corn Borer.—“In the late winter and spring of 1922 as high as 95 per cent of the larvae were removed from standing cornstalks in some of the small home gardens in the environs of Boston, presumably by woodpeckers.” In such commendatory terms is the work of birds on the European corn borer extolled in a recent publication² summarizing information on the history and present status of that destructive insect in the eastern United States. Although such conspicuous work was found to be exceptional, experiments carried out during the winter of 1923-24 in 47 widely separated localities in New England revealed a destruction by birds of an average of 19 per cent of the hibernating larvae. Downy Woodpeckers were found by direct observation to be responsible for most of this beneficial activity.

Field observation revealed the Robin to be an enemy of the borer, when it was found late in spring feeding on exposed larvae on a pile of cornstalks. Grackles, Blackbirds (presumably Redwings) and Starlings also aided at that season by devouring over-wintering larvae that were migrating in search of suitable quarters for pupation.

Reference is made to work conducted by the Biological Survey in the spring and fall of 1920 when C. C. Sperry of that Bureau made a study of the relation of birds to the corn borer. Stomach examination added the Ring-necked Pheasant to the list of bird enemies and the reputation of the Starling was upheld by the finding of six corn borers in a single stomach.

Citrus Insects.—In more general terms has the value of birds been recognized by one trained to view the problem primarily from the viewpoint of an entomologist.³ J. R. Watson in discussing citrus insects and their control gives ample praise to insectivorous birds. “Except for an occasional tree attacked by sapsuckers, birds do virtually no direct injury to a citrus grove,” the writer explains, a refreshing and reassuring thought

¹ Propagation of Game Birds. By W. L. McAtee. U. S. Department of Agriculture. Farmers' Bulletin No. 1521. March, 1927. pp. 1-56. Price 10 cents. Supt. of Documents, Gov't Printing Office, Washington, D. C.

² Caffrey, D. J. and L. H. Worthley. A Progress Report on the Investigations of the European Corn Borer. Bul. 1476, U. S. Dept. Agric., February, 1927. 154 pp., 52 figs.

³ Watson, J. R. Citrus Insects and their Control. Bul. 183 (revision of Bul. 148), Univ. of Florida Agric. Exp. Sta., June, 1926. pp. 293-423, illus.

considering the unqualified condemnation of certain species of birds coming from the orchards and vineyards of California within recent months.—W. L. M. per X.

The Ornithological Journals.

Bird-Lore. XXIX, No. 2. March–April, 1927.

Averages are Fundamental in Economic Ornithology. By W. L. McAtee.—A paper that should be read by all farmers as well as bird protectionists. A species, the White-necked Raven, is shown to be beneficial to one farmer because it is the only check on the devastations of certain insects on his alfalfa, while the same bird is very injurious to his neighbor by destroying his cantaloupes. The Biological Survey aims to constitute itself an agency to average up the character of each species and permit local control by killing, where local depredations warrant it, but to guard against anything like extermination.

Some Bird Residents. By Clarence M. Beal.—Excellent photograph of a Pileated Woodpecker.

The migration and plumage notes cover the Flickers, with a colored plate by Fuertes.

Bird-Lore. XXIX, No. 3. May–June, 1927.

The Meadowlark. By Lorene Squire.

Our Pet Hummingbird. By Mrs. Frank Gilliland.

From Seacoast to Sage-Brush. By Laidlaw Williams.—A trip from Monterey to Klamath Lake.

Relation of Birds to an Outbreak of Locusts. By Leon L. Gardner.

There is a colored plate of the Bittern by Allan Brooks and many interesting photographs.

The Audubon Department contains Dr. Chapman's address on Audubon at the unveiling of the bust in the Hall of Fame.

The Condor. XXIX, No. 2. March–April, 1927.

Black Swifts Nesting in Yosemite National Park. By Charles W. Michael.—Report on weekly visits to a nest in Tenaya Cañon for seven successive weeks. A remarkable contribution to the history of this elusive species.

Banding of Gambel Sparrows in the Fall of 1926. By Joseph Mailliard.

Experience with Cardinals at a feeding Station in Oklahoma. By Margaret M. Nice.

Three Notable Nesting Colonies of the Cliff Swallow in California. By Tracy I. Storer.

A Method of Keeping Notes and Files Dealing with Ornithology. By Alexander Wetmore.

Notes on Swarth's Report on a Collection of Birds and Mammals from the Atlin Region. By Allan Brooks.—A list of additional species observed

at Log Cabin, some fifty miles west, and observations on some of Swarth's identifications.

Dr. Grinnell has a new Thrasher from northwestern Lower California—*Torostoma crissale trinitatis* (p. 127) and A. J. van Rossem a new race of the Sulphur-bellied Flycatcher *Myiodynastes luteiventris swarthi* (p. 126), Huachuca, Mts. Arizona.

The Condor. XXIX, No. 3. May-June, 1927.

An Alberta Aviary. By William Rowan.—An interesting illustrated account of the aviary in which Prof. Rowan is carrying on his experiments on living birds.

The Black Terns of Saskatchewan. By H. H. Pittman.

Seasonal Fluctuations in Bird Life in Central Oklahoma. By Margaret M. Nice.

The Falcons of the McKittrick Pleistocene. By Loye Miller.—*Falco swarthi* (p. 152), new species.

Additional Records from Lower California. By Laurence M. Huey.

Notes on Some Birds of the Southern Extremity of Lower California. By Chester C. Lamb.

Laurence M. Huey describes a Pacific coast race of the Yellow-crowned Night Heron as *Nyctanassa violacea bancrofti* (p. 167), Scammon Lagoon, Lower California.

Dr. Joseph Grinnell describes a new form of Gila Woodpecker, *Centurus uropygialis cardonensis*, El Rosario, Lower California.

The Wilson Bulletin. XXXIX, No. 1. March, 1927.

The Mentality of the Crow. By William Brewster Taber, Jr.

Highway Mortality and Speed of Flight. By Lynds Jones.—Considers that the automobile is not a serious menace to bird life. It is difficult to estimate speed of flying birds by comparison with an automobile because the birds are not flying under normal conditions.

Followed by another article on the same topic. By C. J. Spiker.

Tabulating the Feeding of Nestlings. By A. E. Shirling.

Three Interesting Breeding Records for 1925 from the Piedmont Region of Northeastern Georgia. By Thos. D. Burleigh.—Starling, Grasshopper Sparrow and Dickcissel.

On the Alder Flycatcher. By P. B. Peabody.—Questions the identification of Acadian Flycatcher (Wilson Bull., 1926, p. 43).

Summer Birds in the Vicinity of Plum Lake, Vilas County, Wisconsin. By Alvin R. Cahn.

In 'General Notes' is an interesting account of the nuptial flight of the Woodcock with diagrams by L. W. Turrell. The account of the Annual Meeting of the Wilson Club with officers' reports concludes the issue.

The Wilson Bulletin. XXXIX, No. 2. June, 1927.

The Military Use of the Homing Pigeon. By F. C. Lincoln.

Notes on the Wintering Habits of the White-throated Sparrow. By H. G. Good and T. R. Adkins.

Home Life of the Black Tern in Wisconsin. By Paul W. Hoffman.

Some Observations in a Green Heron Colony. By Bessie P. Reed.—In Kansas.

Autobiography of Leroy Titus Weeks.

Notes on the Birds of Douglas County, Kansas. By Jean Linsdale and E. Raymond Hall.

Bulletin of the Essex Co. [Mass.] Ornithological Club. 1926.

Birds of an Ocean Voyage. By Glover M. Allen.—From Boston to Southampton and thence to west Africa.

Ornithological Reminiscences of Ipswich Beach. By C. J. Maynard.

Ipswich River Bird Trip. By Ralph Lawson.—May 15-16, 1926, ninety nine species observed, the most remarkable being the Arctic Three-toed Woodpecker.

The North American Races of *Falco columbarius*. By James L. Peters.—Recognizes four races, *F. c. columbarius*, *bendirei*, *richardsonii* and *suckleyi*.

The Essex County Shooting Season of 1926. By John C. Phillips.

Notes on the Fay Estate, Historical and Ornithological. By A. P. Stubbs.

There are numerous other local notes, including comparisons of Christmas bird lists at Danvers, Mass., for five consecutive years, ranging from 17 to 22 species, and records of Buff-breasted Sandpiper at Ipswich on August 26, and September 12, 1927, which latter are interesting when compared with one for Cape May, N. J. on September 25 (Auk, 1927, p. 99).

The Oölogist. XLIV, No. 3. March, 1927.

Sandhill Cranes of the Last Frontier. By D. J. Nicholson.—Account of the bird in Orange Co., Florida.

There are several notes on the Snowy Owl.

The Oölogist. XLIV, No. 4. April, 1927.

White Pelican in Captivity. By L. A. Lutringer, Jr.—Records of several of these birds in Cumberland Co., Pa., October 5-7, 1926. (Already published in 'The Auk' for January.) A photograph of the bird is published in the May Oölogist.

The Oölogist. XLIV, No. 5. May, 1927.

Unusual Nesting Sites of the American Raven. By Clinton McBee.—In Washington.

Another article describes the Raven in Georgia, by Charles Newton, and there is an account of bird life at Grassy Island, Louisiana, name of author not mentioned.

The Gull. IX, Nos. 1-5. January-May, 1927.

Many notes of interest on birds of the San Francisco Region and accounts of the trips of the Audubon Society of the Pacific.

The Ibis. (12th series.) III, No. 2. April, 1927.

On the Tongue in Birds. By Leon L. Gardner.—This is a resume of his article in Proc. U. S. Nat. Museum, Vol. 67, pp. 1-49, published in 1925, with some of the same figures reproduced in the plates. Curiously enough the author does not seem to refer to this previous publication.

Some Remarks upon the insect food of the Black-headed Gull. By W. E. Collinge.—Shows the bird to be very beneficial and well worthy of protection at all times.

The Distribution of the Wheatear in Denmark. By Finn Salomonsen.—The breeding bird of East Greenland, Iceland and the Faroes is described as new, *Oe. oe. schiöleri* (p. 202), type from Iceland.

A Note on the Black-face and Yellow-face Grass-Quits in Jamaica. By Miss May T. Jeffrey-Smith.

Some Notes from the Egyptian Oases. By R. E. Moreau.—Visits to Baharia, Dakhla and Kharga in the spring of 1925, by motor. Lists of birds observed in each are given, numbering 59, 54 and 44 respectively. These observations show that a great migratory movement sweeps northwards over the eastern Egyptian deserts in spring. Curiously too they seem to show an almost complete absence of the common resident birds of the Nile Valley.

The Birds of Latium, Italy. By H. G. Alexander. From notes etc. of the late C. J. Alexander.—Detailed discussion of migration, song period and distribution.

On the Summer Avifauna of the Pyrénées Orientales. By Claud B. Ticehurst and H. Whistler.—Annotated list of 116 species.

Fifth Report of the Committee on the Nomenclature and Records of Occurrences of Rare Birds in the British Islands and certain necessary Changes in the Nomenclature of the B. O. U. List of British Birds.

Bulletin of the British Ornithologists' Club. CCCXII, February 26, 1927.

C. Boden Kloss has a note on the races of the Red Jungle Fowl endorsing the conclusions of Riley (Proc. U. S. Nat. Mus., 1924, p. 9).

Dr. Hopkinsom contributes some notes on Gambian birds.

W. L. Selater describes three new African birds of the genera *Bucanodon*, *Alethe* and *Zosterops*.

C. B. Ticehurst discusses the races of *Halcyon smyrnensis* and *Zosterops palpebrosa* describing as new *Z. p. nilgiriensis* (p. 89). G. M. Mathews describes *Micralcyone pusilla masauji*.

On behalf of Prof. M. Menzbier a series of plates of the Gerfalcons was exhibited, with a plan for publishing a monograph on the group, the result of fifty years of study. Four species of *Hierofalco* are recognized. *H. gyrfalco*, *labradorus*, *islandus* and *candicans*.

Messrs. Robinson and Kloss have remarks on various Oriental birds.

Bulletin of the British Ornithologists' Club. CCCXIII. March 25, 1927.

Mrs. Meinertzhagen describes *Pluvianus aegyptius angolae* (p. 100), Angola; Col. Meinertzhagen *Lerwa lerwa major* (p. 101), Szechwan; Stuart Baker, describes *Polihierax insignis cinereiceps* (p. 101), Myawadi, and has a review of the races of *Cerchneis tinnunculus* of which *C. t. objurgatus* (p. 105) is described as new from Nilgiris. He also claims that the genus *Nyctiornis* is invalidated by the prior *Nyctornis*. We think that this claim has been already made by some other writer but we do not regard the two names as identical and until some definite ruling is adopted by the Commission on Nomenclature we should leave such cases alone. C. B. Ticehurst describes *Culicicapa ceylonensis pallidior* (p. 108), Simla.

Bulletin of the British Ornithologists' Club. CCCXIV. April 23, 1927.

N. B. Kinnear describes *Pyrotrogon wardi* (p. 112) N. Burma and *Picumnus cirrhatu confusus* (p. 112) British Guiana.

P. F. Bunyard discusses the coloration of eggs using a tiny electric bulb which can be inserted in the blow hole. He confirms the well known theory that all colored markings on eggs are caused by blood.

W. L. Sclater has various notes on African birds and separates the Swamp Warblers under the name *Calamornis* gen. nov. (p. 118), describing a new form *C. foxi* (p. 118), S. W. Uganda.

H. C. Robinson proposes *Phodilus badius saturatus* (p. 121) for *P. b. nipalensis*, nomen nudum; he also considers *P. b. abbotti* Oberh. identical with *badius*.

Bulletin of the British Ornithologists' Club. CCCXV. May 26, 1927.

Notes on Tanganyika birds. By C. H. B. Grant.

H. C. Robinson describes *Athenoptera spilocephalus stresemanni* (p. 126), West Sumatra. An account of colored drawings of Sumatran birds described by Raffles.

D. Bannerman described a voyage to Senegal and A. L. Butler exhibited a hybrid Hummingbird *Thalurania glaucopis* and *T. eriphyle*.

British Birds. XX, No. 10. March, 1927.

Mr. H. F. Witherby has a most interesting report on his bird-banding operations during 1926, no less than 23,432 birds were banded, five of the hundred odd banders exceeding a thousand birds each. A large number of returns are listed.

British Birds. XX, No. 11. April, 1927.

Ornithological Report for Norfolk. By B. B. Riviere.

The Westward Flight of Autumn Migrants in the Fay Estuary. By Henry Boase.

British Birds. XX, No. 12. May, 1927.

Autumn Movements of the Jack Snipe and Other Birds on a Cheshire Sewage Farm. By T. A. Coward.

Notes from Staffordshire Reservoirs. By A. W. Boyd.

An Inland Migration of Gray Geese. By R. H. Brown.

The Notes of the Raven. By H. A. Gilbert.

Notice of Henry Whitely. By H. S. Gladstone.

The Avicultural Magazine. V, No. 3. March, 1927.

Wallace's Bird of Paradise. By Walter Goodfellow.—A most interesting account of his experience in capturing these birds in Halmaheira and bringing them to England. There is a colored plate by Roland Green.

The Rook. By Viscountess Gray.

The Avicultural Magazine. V, No. 4. April, 1927.

The Thick-billed Parrot (*Rhynchopsitta pachyrhyncha*). By Karl Plath.—With colored plate.

The Avicultural Magazine. V, No. 5. May, 1927.

Owls. By Mrs. E. F. Chawner.—Several plates from photographs of Eagle Owls and Barn Owls.

Some Rare Mexican Birds. By W. Shore-Bailey.—Account of a collection recently imported by an English dealer, nearly all of which are North American species caught in Mexico in winter.

A series of articles on the Australian Parakeets by the Marquess of Tavistock and J. Delacour runs through this journal, with many notes on aviculture.

The Oölogists' Record. VII, No. 1. March, 1927.

The Namaqua Wren-Warbler (*Burnesia substriata*). By H. W. James.—Account of nesting.

Nesting of Wilson's Phalarope, Marbled Godwit and Richardson's Merlin in Alberta. By T. E. Randall.

On the Nesting of the Merlin in Shetland. By W. E. Glegg.—Some excellent photographs.

Nesting Habits of the Lesser Yellow-legs. By A. D. Henderson.—There is an article dealing with the same subject at the same spot in 'The Auk' 1925, pp. 557-583.

Seventh Visit to Muzima Rocks. By C. R. S. Pitman.—It would seem to be desirable to give the readers of the 'Record' some idea as to where the Muzima rocks are, as oölogists are not all expert geographers. This lack of indication of country or continent is frequent in British and German ornithological journals and often we have only some remote province named or some locality like this, which is not given in gazeteers.

The Emu. XXVI, No. 3. January, 1927.

The Kerguelen Petrel (*Pterodroma brevirostris*). By A. J. Campbell.—With colored plate.

Ocean Derelicts. By F. L. Whitlock.—Notes on Australian Petrels.

Some Unsolved Problems of Australian Avifauna. By E. Ashby.

Twenty-fifth Annual Congress of the R. A. O. U. including reports of the various state Secretaries and an account of the camp-out at Williams River where nearly 100 species of birds were observed.

The New Official Checklist of the Birds of Australia. By J. B. Cleland.—Comments.

Some Critical Remarks on Prions. By A. J. and A. G. Campbell.

Birds and Prickly Pear. The committee in charge of checking the distribution of seed of the prickly pear by birds, in view of the demands of landholders, decided on placing bounties on Emus, Crows and Scrub Magpies (*Strepera graculina*) in the area in which the plant grows, but did not countenance a general slaughter of bird life and if the scheme is likely to develop into this it will be altered. For the first six months of 1926 over 8000 Emus and 7000 of their eggs were destroyed, as well as 10000 Crows and 1000 Scrub Magpies at a cost of over \$5,000.

A Trip to Coorong. By M. A. R. Arnold.

Stragglers and Migratory Birds of New Zealand. By R. H. D. Stidolph.

Migration and the Telescope. By Rev. Walter Walters.

The Emu. XXVI, No. 4. April, 1927.

The Scarlet-chested Parrot (*Neophema splendida*). By A. H. Chisholm.—With colored plate.

Birds of Kapiti Island (New Zealand). By A. S. Wilkinson.—This island is being converted into a sanctuary where the native New Zealand birds may be preserved along with the native flora. The introduced domestic animals, which have run wild, have done much damage to plant life but with the killing of them and the replanting with native trees there is every prospect of an ideal sanctuary. The author, who resides on the island, has furnished some excellent photographs of the birds. No less than nine British species have been introduced along with the California Quail.

The Adaptability of Sub-Antarctic and Antarctic Birds to Local Conditions. By A. G. Bennett.

The Southwest Coast of Tasmania. By Clive Lord.—With a list of birds.

New Records from the Swan River District, Western Australia. By D. L. Serventy.

A Review of the Genus *Nesierax*. By Mrs. Perrine Moncrieff.—Claims that there is only one species instead of two as generally considered.

The Snowy Albatross Again. By Tom Iredale.—With remarkably good photographs of flying Albatrosses and Mollymawks.

The Grampian Range of Victoria and its Bird Life. By Edwin Ashby.

Bird Life in the Capricorn Group. By J. A. Edgell.

Fragmentary Bird Notes. By G. A. Heumann.—With photographs of Cape Barren Geese with young and Kagus, in the author's garden, the latter in display.

The Belltrees Oölogical Collection. By A. J. Campbell.

The Little Wattle-Bird (*Anthochaera chrysoptera*). By H. Wolstenholme.

Also many shorter notes and excellent photographs of birds and nests. The checklist still seems to occasion some discussion and there is a note by Mr. Wolstenholme on the case of *Dromiceius* and *Dromaius* for the Emu. The former has priority and Mathews is right in adopting it. The fact that Viellot, the authority for both names, changed it later on has nothing to do with the case. In nomenclature we must consider what a man did, not what he intended to do, and he cannot cancel at pleasure a name once in print.

The South Australian Ornithologist. IX, Part 2. April, 1927.

Birds of South Australia (second edition). By J. Sutton.—A list of the 369 species according to the latest R. A. O. U. Checklist, as against 707 for all of Australian.

Further Notes on Birds of Southeast of South Australia. By F. E. Parsons.—Many local notes and proceedings of the Association.

Revue Francaise d'Ornithologie. No. 214. February, 1927. [In French.]

Note on the Migration of the Fieldfare (*Turdus pilaris*). By L. Ternier.

Migrant Birds which are Attracted by the Lighthouses of Holland. By R. Villatte des Prunes.

Bibliography of the Avifauna of the French Regions. By M. Legendre. (completed) in No. 216. Obituary of Xavier Raspail.

Contributions to a Biological Study of the Woodcock. By O. de Zedlitz.

Revue Francaise d'Ornithologie. No. 215. March, 1927. [In French.]

Differentiation of Young Birds of *Larus argentatus argentatus* and *L. fuscus affinis*. By J. Rapine.

Ornithology of the Department of Sarthe. By M. Legendre.—Annotated list of 259 species.

Revue Francaise d'Ornithologie. No. 216. April, 1927. [In French.]

The Origin of the Pheasant of Europe. By Cl. Gaillard.

Regarding the Serin. By H. Jouard.

Nyroca ferina. By P. Madon.—Food habits etc.

L'Oiseau. VII, No. 11—VIII, No. 3. November, 1926—March, 1927. [In French.]

An account of the Parrots by Marquis of Tavestock runs through the first two numbers followed by the Owls by Miss Ethel Chawner, [January and February] and the Diurnal Birds of Prey by B. A. Gurney [March.]

On the Air Sacks of Birds. By A. Mouquet. [November.]

- The Birds of Japan. By J. Delacour. [November.]
A Collection of Birds from Sfax [Tunis.] By J. Delacour. [December.]
The Penduline Tits of Europe. By M. Legendre [February.]—*Anthus pendulinus pendulinus* and *A. p. caspius*.
Description of a New Species of Tanager. By J. Berlioz. [March.]—*Tangara arnaulti* (p. 95) received alive, locality of capture unknown.

Ornithologische Monatsberichte. 35, No. 2. March-April, 1927. [In German.]

Snigirewski has a new race of *Sylvia curruca*, *S. c. turkmenica* (p. 35) Transcaspia.

Stresemann describes *Callocalia francica bartelsi* (p. 46) West Java.

A note on the Steamer Ducks *Tachyeres cinereus* and *T. palachonicus* by E. Stresemann discusses the relationship of these forms while a note on the name *cinereus* is added (p. 54); there is an announcement of the discovery of a specimen of *Pennula sandwichensis* the flightless Hawaiian Rail in the Vienna Museum and H. Grote discusses the "formenkreis" *Trachylaemus purpuratus*. Many local notes etc.

Ornithologische Monatsberichte. 35, No. 3. May-June, 1927. [In German.]

On the wild nesting of *Hirundo rustica*. By H. Grote.—Away from man's abodes. A collection of data on "wild" nesting of our Barn Swallow would be equally interesting.

A contribution to our Knowledge of Tatra Birds. By J. Domaniewski.

The Black Oystercatcher. Mutation-study XVI. By E. Stresemann.

A New Cuckoo from Southern Brasil. By E. Snethlage.—*Neomorphus dulcis* (p. 80) Lagoa Juparana, Espirito Santo.

Dr. Stresemann has a note on the fosterers of *Eudynamis scolopacea salvadorii* and one on *Puffinus heinrothi* and describes as new *Podargus papuensis pumilus* (p. 87) Southern New Guinea.

E. Gebhardt reports *Passer domesticus* in the Falkland Islands, and O. Neumann describes *Pyrrhura perlata coerulescens* (p. 89) Miritiba Dist., and *P. p. anerythra* (p. 89) Tocantins.

Contributions to the Breeding Habits of Birds. [In German.] III, No. 2. March, 1927.

Birds Eggs from Mallorca. By Rev. F. C. R. Jourdain. (continued in No. 3.)

Food Notes of a Sparrow Hawk Brood. By O. Uttendorfer.

The Breeding Time of Birds of "Little" Africa. By E. Hartert. (continued in No. 3.)

Brood Biology of Golden Eagles and Fish Hawks. By J. Karpelin.

Ornithological Results of Two Short trips to the Balearic and Pityusic Islands. By P. Henrici. (continued in No. 3.)

Ardea. XVI, No. 1. February, 1927. [Mainly in Dutch.]

On the Occurrence of Summering Limicolae in Adult Plumage. By J. G. Van Oordt. [In English.]

Falco peregrinus and *Larus fuscus affinis* as Breeding Birds in Holland. By G. A. Brouwer.

A Specimen of *Fulmarus glacialis* with Feathered Legs. By J. Verwey. [In English.]

The Breeding Colonies of the Cormorant (*Phalacrocorax carbo sub-cormoranus*) in Holland. By G. A. Brouwer.

On the Movements of the Southern and Northern Guillemots off the Dutch Coast. By J. Verwey.

Yearbook of the Netherlands Ornithological Club. 16, No. 4. April, 1927. [In Dutch.] Sketch of Dr. R. C. E. G. J. Baron Snouckaert van Schauburg. With portrait. On the occasion of his seventieth birthday.

Indian Oölogical Notes. By H. J. V. Sody.—With photographs of Cuckoo's eggs and those of their hosts.

Notes on Some Javan Birds. By C. Boden Kloss. [In English.]

Ornis Fennica. IV. No. 1. 1927. [In Scandinavian and German.]

On *Phylloscopus borealis borealis*. By Alb. Collin.

On Individual Variation in *Haliaeetus albicilla*. By Ivar Hortling.

Ornis Fennica Sonderheft. 1927. [In German.]

The Bird Life of Yttero [Norway] in the Summer and Winter of 1926. By Ivar Hortling pp. 1-237. Many diagrams of foot impressions.

Ornithologische Beobachter. XXIV, Nos. 6, 7, and 8. March, April and May. 1927. [In German and French.]

Contain many short articles and notes on Swiss birds and on Bird Protection in Switzerland.

Wild Fowl guests at the port of Geneva. By R. Poncy (April).—With numbers of the different species.

Danske Fugle. VIII, No. 1. 1927. [In Danish.]

Banded Gulls (*Larus canus* and *L. argentatus*) with recoveries, Nesting of *Haliaeetus albicilla* in Denmark, all by P. S. Knogaard.

An error occurred in our notice of this journal in the April 'Auk,' where it was stated that the Sparrow Hawk was "largely a migrant." It is not a migrant in Denmark.

Ornithological Articles in Other Journals.

Griscom, Ludlow. The Observations of the Late Eugene P. Bicknel at Riverdale, New York City, Fifty Years Ago. (*Abstract Proc. Linnaean Society of N. Y.*, Nos. 37-38.)

Kuerzi, John F. A Detailed Report on the Bird Life of the Greater Bronx Region. (*Abstract Proc. Linnaean Society, N. Y.*, Nos. 37-38.)

Walsh, Lester L. Birds of Prospect Park, Brooklyn. (*Abstract Proc. Linnaean Society, N. Y.*, Nos. 37-38.)

Lewis, Harrison F. Production of Eider-Down in Canada. (*Canadian Field Naturalist*, February 1927.)

Thacker, T. L. The Earliest Recorded Observations on American Birds. (*Canadian Field Naturalist*, February, 1927.)—Describing bird notes in Columbus' journal of his first voyage.

An article based upon the same data was published by Frank M. Chapman in 'Our Animal Friends' for October, 1895 and reprinted in a volume of papers presented at the Worlds Congress on Ornithology held at Chicago in 1893 and published in 1896.

Criddle, Norman. Habits of the Mountain Bluebird in Manitoba. (*Canadian Field Naturalist*, February, 1927.)

Lewis, Harrison F. Destruction of Birds by Lighthouses in the Provinces of Ontario and Quebec. (*Canadian Field Naturalist*, March, 1927.)

Munro, J. A. Gull Colonies on Lake Newell, Alberta. (*Canadian Field Naturalist*, March, 1927.)

Wood, A. A. Some Rare Birds at Strathroy, Ontario. (*Canadian Field Naturalist*, March, 1927.)

MacLoughlin, Anna E. Do Birds Practice their Songs? (*Canadian Field Naturalist*, March, 1927.)

Munro, J. A. The Waterfowl Sickness at Lake Newell, Alberta, 1925-1926. (*Canadian Field Naturalist*, April, 1927.)—The alkali condition considered to have caused the duck sickness in Utah was not present and it is thought that the malady might be due to poisons or parasites developed in the decomposition of the abundant algae. In 1926 there was no accumulation of algae and there was no duck sickness.

Editorial. Scottish Bird Sanctuaries. Proposal to create them in the Royal Parks of Scotland.

L. J. Rintoul and E. V. Baxter. On the Decrease of Blackgame in Scotland. (*The Scottish Naturalist*, January-February, 1927. continued in March-April issue.)

Patterson, John. The British Willow Titmouse in the Clyde Area. (*The Scottish Naturalist*, January-February, 1927.)

Stenhouse, J. H. Bird Notes from Fair Isle. (*The Scottish Naturalist*, March-April, 1927.)

Gromme, Owen J. Wild Life in the Land o' Lakes. [Wisc.] (*Yearbook Milwaukee Public Museum*, 1925.)

Gromme, Owen J. Another Season with the Sandhill Crane. (*Yearbook Milwaukee Public Museum*, 1925.)

Gillespie, Mabel. At the Sign of the Snakeskin. (*American Forests and Forest Life*, June 1, 1927.)—Illustrated account of the nesting of the Crested Flycatcher. Further account of the occupants of the nesting site described in 'The Auk' 1924, pp. 41-44.

Hanna, W. C. Destruction of Golden Eagles in California. (*California Fish and Game*, September, 1927) with further note by Wright M. Pierce in January, 1927 issue.

Arthur, Stanley C. Report of the Division of Wild Life. (*Biennial Report of the Louisiana Department of Conservation, 1924-26.*)—Interesting data on Ducks and Geese and the wild life reservations.

Stone, Witmer. The Distribution of Bird Life in Ecuador. (*Natural History*, XXVI, 6, 1926.)—Review of Champan's work of that title.

Stone, Witmer. The Study Collection of Water Fowl. (*Yearbook of the Acad. Nat. Sciences*, Philadelphia, 1926.)

Meylan, Oliver. On the winter sojourn of certain birds in the Basin of Leman and the conditions which determine it. (*Bull. Soc. Zoologique de Geneve*, III. No. 6, January, 1927.)

Dickey, D. R. and Van Rossem, A. J. The Spotted Rock Wrens of Central America. (*Proc. Biological Society of Washington*, 40, pp. 25-28, March 5, 1927.)—*Salpinctes guttatus guttatus* ranges from Guatemala to Salvador, with *S. maculatus* Ridgway as a synonym while *S. g. fasciatus* is the form of Nicaragua and northern Costa Rica.

Riley, J. H. Note on the Genus *Irena* Horsfield. (*Proc. Biol. Soc. Wash.*, 40, pp. 23-24, March 5, 1927.)—Proposes a new genus *Irenella* (p. 23) for *I. cyanogastra* and considers Oberholser's *Glauconympha* a synonym of *Irena*.

Howell, A. B. On the Faunal Position of the Pacific Coast of the United States. (*Ecology*, January, 1927.)—Considers that there has been only a moderate subspecific change among west coast mammals since the Pleistocene; that glaciation did not extend so far south on the Pacific as on the Atlantic coast, due to the presence for a long time of a warm ocean current. The species not having to meet violent climatic changes or to make extensive migrations are now less tolerant of environmental fluctuations and many are therefore found today with restricted distribution. Deals mainly with mammals but the discussion is of equal interest to ornithologists.

Carter, T. Donald. The Story of a Snowy Owl. (*School Bulletin, Univ. State of New York*, March, 1927.)

Dale, E. M. Spring Arrival Dates of Birds of London District (Ontario).—Compiled from seventeen years records of the McIlwraith Ornithological Club. Printed by the Club.

CORRESPONDENCE

Kennard on Snow Geese

Editor of the Auk:

To the casual reader of the editor's review in these pages (44, No. 2, p. 276-278) of Mr. Kennard's article on Snow Geese (Proc. N. E. Zool. Cl. 9, 16 Feb. 1927, p. 85-93) it would appear that Mr. Kennard had attempted to prove the specific difference of the Greater and Lesser Snow Goose on the basis of measurements alone and that in giving a new name to the larger bird he had ignored a previous restriction of Forster's *Anas nivalis*.

A careful perusal of Mr. Kennard's account will show that he did not base specific distinctions on size alone, but that he especially stressed the following characters: the color of the tarsus of the downy young Lesser Snow Goose is black, while the downy young of the Greater is 'mummy brown' or 'dark citrine.' There is also a constant color difference in the tarsi of immature examples of both species. Furthermore a table of *weights* of adult specimens shows no overlapping, but on the contrary brings out very well the important character of the much "stockier build" of the Greater Snow Goose.

The editor claims that Cassin (Proc. Ac. Nat. Sci. Phila., 8, 1857, p. 41) "years later" restricted Forster's name *nivalis* to the greater Snow Goose, and that Cassin's action takes precedence over Kennard's. This would be the case if Cassin had actually "restricted" *nivalis* and had had the true facts behind him, but he did nothing of the kind. He distinguished for the first time the two Snow Geese, applying *Anser hyperboreus* Pallas to the "larger bird more frequent on the Atlantic coast of North America" under which he cited Forster's name as a synonym, and described *Anser albatus* "western and Northern America, Oregon, rare on the Atlantic." In other words Cassin was mistaken regarding the identity of Pallas' bird, which was certainly a Lesser Snow Goose, and if he did any 'restricting' at all he restricted *hyperboreus* to the Greater Snow Goose, an obvious error that cannot stand as a valid action in face of the facts. Placing *nivalis* as a synonym does not constitute a separate restriction: it must stand or fall with *hyperboreus*.

Mr. Kennard has shown that Forster's description is not sufficient to determine whether the birds he described were Greater or Lesser Snow Geese. Forster apparently was familiar with a white Goose in literature, and he included references that applied to both species, but the specimens he described came from the Severn River, where Mr. Kennard has shown only the Lesser Snow Goose occurs and where at the present time, as it did then, it migrates through in thousands. Forster says, "These white geese are very numerous at Hudson's Bay many thousands being killed annually with the gun." There is no reason to suppose that the snow geese of Hudson Bay in Forster's time belonged to a different species

from the one found there today, so we must take into account all that Forster says of its movements and occurrence there, as Mr. Kennard has done, and thus fix the name with a degree of certainty that is impossible if we depend on the description alone.

The editor argues that this case is analogous to that of subsequent designation of generic types where the ultimate result is quite different from that possibly intended by the original proposer of the genus, but the analogy is misleading for the genus is an artificial grouping whose limits are pretty much a matter of individual opinion, while the species is a natural unit that cannot be dealt with in such an arbitrary fashion.

An arbitrary restriction of a name to a particular species cannot stand after new evidence reveals an error. This evidence we believe Mr. Kennard has furnished conclusively, and the misapplication of names, used for many years for the Snow Geese through ignorance of their relationships, their migrating routes and winter and summer ranges, should be rectified on the basis of present day knowledge, not perpetuated in deference to the unwitting blunder of an early ornithologist.

A. CLEVELAND BENT
OUTRAM BANGS
JAMES L. PETERS

[The Editor has only praise for the ornithology of Mr. Kennard's excellent paper but wished to point out the possibility of differences of opinion regarding the nomenclatural problems involved. He was careful to state that "others may not agree with our views" and in this, at least, he seems to be correct! He still maintains that there are two sides to the question as the rules of nomenclature unfortunately do not recognize the rectifying of "unwitting blunders."—W. S.]

Snowy Owl Report

The Editor acknowledges with thanks all the data on Snow Owls kindly submitted by correspondents. The letters were all sent to Prof. A. O. Gross who had already collected much material from New England and who was likewise in receipt of the data gathered by Mr. Ruthven Deane. Prof. Gross has prepared a summary of the flight which will appear in the October 'Auk.'

NOTES AND NEWS

ALLAN OCTAVIAN HUME, an Honorary Fellow of the American Ornithologists' Union elected at the first meeting in 1883, died at his home, The Chalet, Upper Norwood, England, July 31, 1912, at the age of 83. No notice of his work having been published in 'The Auk' at the time of his death, it is desirable that some record of it should appear in this journal. Mr. Hume was born in England June 6, 1829, and was the youngest son of Joseph Hume, a former well-known Member of Parliament. At the age of 20 he graduated from the East India College at Haileybury and entering the Indian Civil Service was detailed to the Northwest Provinces. When the Indian Mutiny broke out he was acting as Collector at Etawah between Agra and Cawnpore, and on account of meritorious service on this occasion received the award of C. B. in 1862. In following years he filled various high positions in the Home, Revenue and Agricultural Departments of the Indian Service at Simla and as Secretary to the Government of India. In 1870 he returned to the Northwest Provinces as a member of the Board of Revenue and in 1882 retired from the Indian Service but did not return to England until some years later.

During his years of residence in India, but chiefly between 1862 and 1885, Hume devoted his spare time assiduously to ornithology and with the aid of various collectors, especially William Ruxton Davison, brought together one of the largest collections of birds ever amassed by any private individual. These he preserved at his home in Simla in a room specially designed for the purpose. He had outlined a complete work on the birds of India, but by accident his nearly completed manuscript was destroyed in 1885. He thereupon abandoned his work on Indian birds which would necessarily have to be largely rewritten and offered his entire collection to the British Museum of Natural History. After two years of negotiation Dr. Bowdler Sharpe, then at the head of the bird department, went to India to pack and ship the specimens, and in 'The Ibis' for 1885 (p. 456) gave an interesting account of his trip to Simla and his return with the Hume collection. This collection contained 62,000 bird skins, including 258 types, and about 19,000 eggs. In the words of Dr. Sharpe it was "one of the most splendid donations ever made to the Nation, and added to the Museum the most complete collection of birds and eggs from the British Indian Empire the world has ever seen."

Hume's contributions to Indian ornithology were numerous and important. In addition to short notes and brief articles he published a number of separate works, among which may be mentioned the following: 'My Scrap Book, or Rough Notes on Indian Oölogy and Ornithology' (1869-70); 'Nests and Eggs of Indian Birds' (1873-75); 'The Indian Ornithological Collector's Vade Mecum' (1874); 'List of the Birds of India' (1879); with William Davison, 'List of the Birds of Tenasserim'

(1878); and with C. H. T. Marshall 'The Game Birds of India, Burmah, and Ceylon' (1879-80).

He was also editor and publisher of an ornithological journal known as 'Stray Feathers,' of which 11 volumes appeared at Calcutta between 1873 and 1888. A 12th volume containing a general index of the whole series was published by Charles Chubb in 1899.—T. S. P.

It may interest readers of 'The Auk' that the great collection of birds made by Rock in western Kansy, China, is probably all safe and sound. Thirteen large boxes have already been received at the Museum of Comparative Zoology, containing several thousand skins from the Nanchan and Richthofen ranges and from various localities in Choni, Labrang and Tebby country. Much of this region was entirely unknown ornithologically. The balance of the collection is reported to have reached Shanghai safely and to have been shipped to Boston.

The Museum of Comparative Zoology has also acquired Mr. Arthur Loveridge's collection of African birds. This series contains several genera and many species new to the collection and, although the series of individuals of any one species is small, the number of forms represented is about 760. Since this collection is very largely from Tanganyika Territory and especially from the higher mountain ranges it will fill many gaps in the Museum collection. Mr. Loveridge has also just returned from the Uluguru and Usambara ranges where he has been collecting for some months and this collection has also been safely received in Cambridge.

The second shipment of the La Touche collection has also come safely to hand. His birds were largely from eastern China and supplement the Rock material in a most useful way.

THE Baird Ornithological Club of Washington, D. C., held its Fifth Annual Meeting on March 23, 1927, when officers for the ensuing year were elected as follows: President, Bradshaw H. Swales; Vice President, Alexander Wetmore; Secretary, Frederick C. Lincoln; Members of the Council, Charles W. Richmond and Theodore S. Palmer. Paul Bartsch was elected to Active Membership.

During the year papers were presented by Doctors Fisher, Bell, and Palmer and Messrs. Goldman, Howell and Lincoln. Guests entertained by the Club during this period, include, Dr. B. W. Evermann, of San Francisco, Calif., Dr. John C. Phillips of Wenham, Mass., Dr. Charles W. Townsend of Ipswich, Mass., R. Bruce Horsfall, of Washington, D. C., Donald R. Dickey, of Pasadena, Calif., and Ernest P. Walker of Juneau, Alaska.

The 75th birthday of Dr. Leonhard Stejneger was celebrated on October 27, 1926 with appropriate ceremonies.—F. C. LINCOLN, *Secretary*.

THE New England Sportsmen's Show held in Boston January 28-February 5, was an unqualified success. Made possible by a guarantee fund raised by the Massachusetts Fish and Game Protective Association

and sponsored and put through by that Association, it differed markedly from any previous shows of that nature.

As we look back thirty odd years to the first of the Boston Sportsmen's Shows, and they were creditable Expositions too, we realize what great advances have taken place in the public's interest in all sorts of outdoor activities. But perhaps even more remarkable is the changing attitude of the shooter and fisherman towards the wild life which he is dependent on for his recreation. I am sure that had they tried in the older Shows to stress the importance of conservation, fire protection, sanctuaries, and even wildflower preservation, they would have been laughed out of court. But all these things are now taken as a matter of course, be they purely sentimental or not.

The popularity of this Show was evidenced by the enormous attendance, (over forty-five thousand in the last two days alone). Eastern Canada was well represented, so were the Canadian National Parks and larger Railroads and all of them sent competent men who were supplied with attractive and instructive leaflets and booklets. Our own American National Parks, our Biological Survey, our Forest Service and Bureau of Fisheries set up splendid exhibits and these educational features were given the most prominent sites.

The Fish and Game Commissions of all the New England States were well represented;—in one case even the State Forestry Department, so that visitors from out of the way parts of New England could find a State booth where they could meet friends and talk over local affairs.

In conservation, travel, or natural history, the following Societies fitted out more or less elaborate display booths: Federation of the Bird Clubs of New England, Massachusetts Audubon Society, National Association of Audubon Societies Harvard Travellers Club, Boston Society of Natural History, Massachusetts Forestry Association, Izaak Walton League of America, New England Wild Flower Preservation Society and our own Massachusetts Fish and Game Protective Association.

So encouraging was the response to our efforts that we hope to stage another Sportsman's Show in two or three years time.—JOHN C. PHILLIPS, *Massachusetts Fish and Game Protective Association 3 Joy St., Boston.*

Mrs. Grace Rainey Rogers has given \$156,000 to the National Association of Audubon Societies. The sum is to be held as an Endowment Fund for the maintenance of the Paul J. Rainey Wild Life Sanctuary in Louisiana. This territory, owned by the late Mr. Rainey and used by him and his friends as a shooting preserve, was presented to the Audubon Association by his sister, Mrs. Rogers in 1924. The endowment is given in lieu of the annual contributions which she has hitherto provided for its upkeep.

"This Louisiana Sanctuary is the largest of our bird reservations. For three years," said Dr. Pearson, "we have been guarding these 42 square miles of marsh. We do a good deal in the way of planting of duck foods and by other means seek to render the Sanctuary attractive to the vast

swarms of Wild Fowl that resort to the region in Winter. More than 50,000 Wild Geese were on the Sanctuary at one time the past season. One of the great needs today is for more wild life sanctuaries," he added. "Large areas where no shooting can ever be permitted are needed in order to secure the future supply of Wild Fowl. There should be a series of these along the lines of migratory flight down the Atlantic and Pacific seaboard, as well as throughout the length of the Mississippi Valley."

PRESIDENT COOLIDGE, by a recent Executive Order, has set aside a tract of about 2,350 acres in Jasper County, S. C., as a preserve and breeding ground for native birds. The area embraces certain abandoned rice lands belonging to the United States abutting on the Savannah River, near Savannah, Ga., and is to be known as the Savannah River Bird Refuge.

The new reservation has been placed under the administration of the Biological Survey of the United States Department of Agriculture. It will be unlawful for any person to hunt, trap, capture, disturb, or kill any bird or wild animal of any kind whatever, or take or destroy the eggs of any such bird, or to injure, molest, or destroy any property of the United States within the limits of the reserve, except under such rules and regulations as may be prescribed by the Secretary of Agriculture.

THE Legislature of Indiana has just passed and the Governor has signed a law giving protection throughout the year to the American or Bald Eagle.

It is a fineable offense to kill or shoot the bird and to molest its nest or eggs. This law will become effective during April, 1927. It was largely through the efforts of the Indiana Audubon Society and the Isaac Walton League that this measure was passed. Numerous articles were written and printed in the daily papers at intervals during the legislative session.—S. E. PERKINS III.

MUCH interest was shown on May 27 by lovers of birds and friends of the late Theodore Roosevelt in the unveiling of a memorial bronze group of unusual attractiveness. The ceremony took place at Oyster Bay on the grounds of the Bird Sanctuary owned and maintained by the National Association of Audubon Societies. Adjoining it is the little cemetery where President Roosevelt lies buried.

Dr. T. Gilbert Pearson, President of the Audubon Association said, "We are here today for the unique purpose of unveiling a memorial to a former President of the United States because he was a lover of wild birds. While occupying the position of President, at the suggestion by the Audubon Society, he created by executive order various Federal bird reservations where the wild denizens of sea or land might for all time find sanctuary.

"The gifts of more than two thousand of our members and friends made possible the erection of this fountain, the conception of the form and the execution of which, was wrought by the mind and the hands of one of America's most beloved sculptors, Bessie Potter Vonnoh.

In its composition the fountain is designed to represent the relation of children to the living birds in both of which Theodore Roosevelt ever held such a deep and abiding interest. In the figure the girl is seen providing water for the birds in summer while the little boy at her feet holds a tray with which to furnish birds with food in winter."

Dr. Frank M. Chapman, said "Theodore Roosevelt was born with a bird in his heart and it sang to him throughout his life. As a boy its voice appealed to him so strongly that at one time he determined to become an ornithologist. At the age of fourteen a 'Roosevelt Museum of Natural History' was established. Numerous specimens were collected, some of which, now in the American Museum, bear witness to the care with which they were prepared. Observations on the relation between color, habit and environment in certain Egyptian birds made at this time show that the young naturalist was not merely a collector, but also a student of bird-life.

Dr. Eugene Swope and Mr. George K. Cherrie also spoke.

THE Ceylon Government proposes to publish 48 finely executed coloured plates of Ceylon Birds.

The plates are the work of Mr. G. M. Henry and a short description of each bird has been prepared by Mr. W. E. Wait, M. B. O. U., C. F. A. O. U.

PART I. (Sixteen plates) will be ready on July 1, 1927, and the remaining parts will be issued at yearly intervals.

Price for each part of 16 plates—£. 1. 10s. from Dulau & Co., 32 Old Bond St., London, W. 1 or The Colombo Museum Colombo, Ceylon.

THE Secretary of Agriculture, with the approval of the President of the United States, has reduced the bag-limit on Woodcock to four instead of six. Yellow-legs, which were found to be not increasing, have been given a closed season for two years, so that during 1927 and 1928 the only "shore-birds" that may be shot are Wilson's Snipe and Woodcock. Attention has been especially called to the illegal killing of Upland Plover in Texas, owing to an impression that the shooting of this bird was permissible. The Reedbird or Bobolink is now protected at all times throughout the United States except that persons owning or leasing lands in the Carolinas, Georgia or Florida, may shoot them from August 16 to November 15 when seriously injuring their rice fields, under special permit from the Secretary of Agriculture.

THE Heath Hen situation on Marthas Vineyard does not seem to improve, as only thirteen birds could be found at the annual census for 1927. Previous estimates however may have been a little too large although it seems certain that the total number now living is under twenty.

The possibility of the young having died from 'blackhead' disease introduced by poultry, which have been permitted to roam on part of the reservation used by the Heath Hens, has caused the banishment of the poultry; while shooting rabbits in the adjoining woodland has been pro-

hibited and planting of garden patches of vegetables relished by the birds has been continued. An additional warden has been supplied and everything possible is being done in a last effort to save the species.

THE report of Dr. Thomas Barbour, President of the executive committee of the Institute for Tropical Research in America, on the Barro Colorado Island Biological Station, is most interesting, presenting the possibilities offered to students, details of transportation and expense etc.

Dr. Frank M. Chapman spent part of the winter and spring (December 22 to April 1) at the laboratory studying the habits of *Zarhynchus* one of the Hang-nests and photographing wild life. He also presented the station with the cottage which he had erected for his use and which is now available for others.

An endowment of \$250,000 is needed to place this unique and invaluable station on a permanent basis and it is earnestly hoped that this may, in some way, be realized. Dr. Barbour's interest and generosity in planning and helping to maintain Barro Colorado is worthy of all the support that can be given.

WHARTON HUBER of the Academy of Natural Sciences of Philadelphia is at Bear River Marshes, Utah, obtaining additional material for the study series of Ducks being assembled at the Museum. The expedition is made possible through the support of Philadelphia sportsmen.

WE learn of the return of the Abyssinian expedition of the Field Museum of Natural History with a valuable collection of birds and mammals.

MR. WALLACE HAVELOCK ROBB has given to the Royal Ontario Museum of Zoology his collection of paintings of Canadian Birds by Major Allan Brooks, the formal presentation to take place in October. Meanwhile a plan is under way to publish reproductions of these paintings in colors, the first of which by Brigdens Ltd. of Toronto represents the Rose-breasted Grosbeak and is an exceptionally fine piece of color work.

THE Audubon Society of the District of Columbia has cooperated with the Public Library in compiling and publishing a small pamphlet of 'Bird Books' recommended by the Society. The titles are arranged under several headings: Books for Identification and Reference; Books for Popular Use; Books for Young People and Periodicals. The shelf or catalogue number of each book is given.

DR. ALEXANDER WETMORE has just returned from an expedition to San Domingo and has brought back a valuable collection of birds including one species new to science.